OLYMPUS

MULTI-TRACK LINEAR PCM RECORDER

LS-100

Multi-Track Linear PCM Recorder

User's Manual

EN

Thank you for purchasing the Multi-Track Linear PCM Recorder. Carefully read through this manual to ensure that you use the product properly and safely. Be sure to keep this manual on hand so that you can refer to it at any time.
To ensure successful recording, perform a trial recording beforehand.

Preface

Description of This Manual

- This manual is subject to change without notice. For the latest information such as the product name and model number, contact our customer support center.
- The illustrations of LCD screens and the recorder in this manual may differ from the actual product. Although every effort has been made to ensure the accuracy of information in this manual, contact our customer support center in case that you notice a questionable description, error, missing information or other point.
- This manual is the copyrighted work of Olympus Corporation and Olympus Imaging Corporation. It is prohibited under the Copyright law to copy this manual or distribute the copy without permission.
- We bear no responsibility for any damage, lost earnings, or claim from a third party incurred by improper use of the product.

Trademarks and registered trademarks

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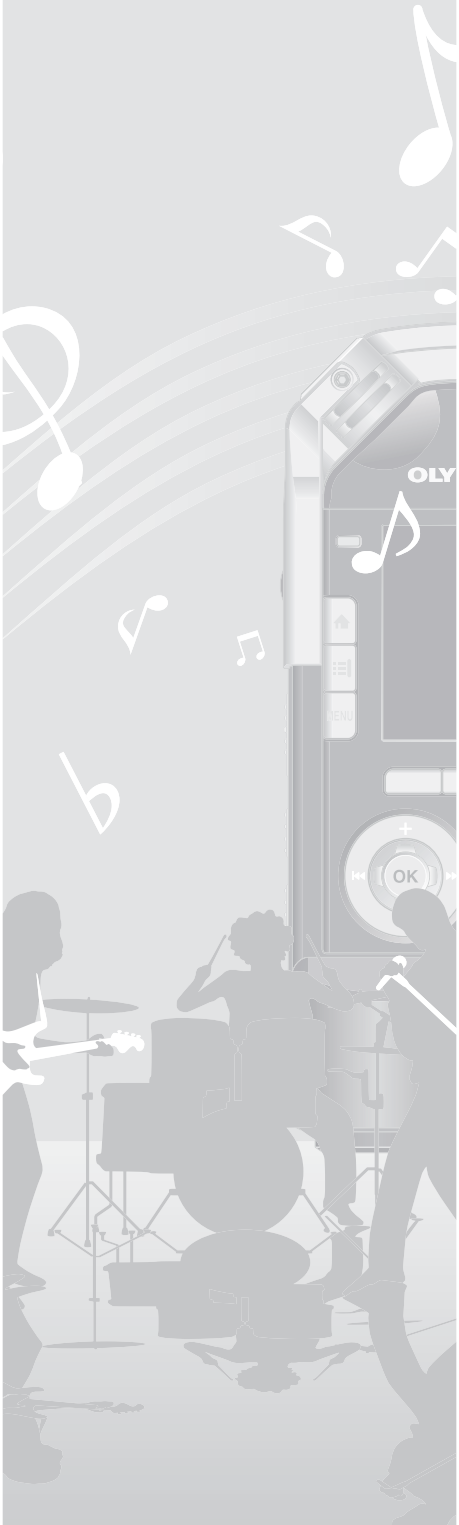
- Microsoft, Windows, and Windows Media are registered trademarks of Microsoft Corporation.
- SD, SDHC, and SDXC are trademarks of SD Card Association.
- Macintosh and iTunes are trademarks of Apple Corporation.
- The MP3 audio encoding technology is used in the product based on the license from Fraunhofer IIS and Thomson.
- The tuner, metronome, speech speed conversion, and key shifter technologies are realized using "CRIWARE" from CRI Middleware Co., Ltd.

All other brand names and product names in this manual are trademarks or registered trademarks of respective owners.



INDEX

Preface	P.2	
Overview of Recorder	P.11	1
Startup	P.21	2
Recorder Mode	P.32	3
Multi-Track Mode	P.53	4
About the Tuner, the Lissajous, and the Metronome	P.66	5
Menus	P.71	6
About the PC	P.116	7
For Quick Reference	P.122	8

Table of Contents

Preface

Description of This Manual 2
Safety precautions 6
Checking Accessories 10

Chapter 1 Overview of Recorder

Main Features 12
Name of Each Part 13
Connecting with External Devices 15
Let's use LS-100! 16
Recording Tips for Each Instrument 18
Connection of the XLR/Standard Phone Combo Jack and Phantom Power Supply 20

Chapter 2 Startup

Power Supply 22
Inserting the battery 22
Recharging the battery 22
How to Use the POWER/ HOLD Switch 25
Turning the power on 25
Turning the power off 25
Activating the hold mode 26
Clearing the hold mode 26
Initial Settings before Using the Recorder 27
Setting the date and time [Time & Date] 27
How to set the voice guide 28
Inserting and Removing the SD Card 29
Inserting the SD card 29
Removing the SD card 30
Operations on the Home Screen 31

Chapter 3 Recorder Mode

What You Can Do in the Recorder Mode 33
Recorder Mode 33
Files and Folders 34
Before Recording 36
Recording 37
Normal Recording [Normal] 37
Overdubbing [Overdub] 39
Play Sync [Play Sync] 41
Voice Sync Recording [V-Sync. Rec] 43
Recording using the metronome 44
Searching for files 45
Playback 46
Playback 46
Placing an index mark 48
Segment repeat playback 49
Erasing 50
Erasing a File 50
Partially erasing a file 51

Chapter 4 Multi-Track Mode

What You Can Do in the Multi-Track Mode 54
Multi-Track Mode 54
Files and Folders 55
Creating a Multi-Track Project 57
Erasing a Multi-Track Project/Track 64
Erasing a project 64
Erase a track 64

Table of Contents

Chapter 5
About the Tuner, the Lissajous, and the Metronome

Using the tuner ••••••••••••••••••••••••••••••• 67
About the Lissajous measurement ••••• 69
Using the metronome ••••••••••••••••••••••• 70

Chapter 6
Menus

How to set the menus ••••••••••••••••••••••• 72
List of menus ••••••••••••••••••••••••••••••••• 74
Recording menu [Rec Menu]••••••••••••• 79
Recording mode [Rec Mode] ••••••••••••••79
Microphone gain [Mic Gain] ••••••••••••••••80
Recording level [Rec Level]••••••••••••••••81
Input switch [Input Select] ••••••••••••••••82
Microphone power source [Mic Power]•••83
Recording format[Rec Format]••••••••••••84
Low cut filter [Low Cut Filter] ••••••••••••••85
Pre-recording [Pre-Recording] ••••••••••••86
Recording monitor [Rec Monitor]•••••••••87
Play menu [Play Menu]••••••••••••••••••••• 88
Play mode [Play Mode]••••••••••••••••••••••88
Skip space [Skip Space] ••••••••••••••••••••88
File menu [File Menu] ••••••••••••••••••••• 90
Erase lock [File Lock] ••••••••••••••••••••••90
File Move/Copy [Move/Copy] ••••••••••••••91
File divide [File Divide] ••••••••••••••••••••94
Property [Property]••••••••••••••••••••••••••95
MP3 Convert [MP3 Convert] ••••••••••••••••95
CD write [CD Write]••••••••••••••••••••••••••97
Bounce [Bounce] ••••••••••••••••••••••••••••98
Metronome menu
[Metronome Menu] ••••••••••••••••••••100
Metronome [Metronome] ••••••••••••••••• 100
LCD/Sound menu
[LCD/Sound Menu] ••••••••••••••••••••102
Backlight [Backlight] ••••••••••••••••••••••• 102
LED [LED]••••••••••••••••••••••••••••••••••••103
Beep sound [Beep] ••••••••••••••••••••••••••103
Language switch (Lang)
[Language (Lang)]••••••••••••••••••••••••104
Voice guide [Voice Guide] ••••••••••••••••104
Intro play [Intro Play] ••••••••••••••••••••••105
Device menu [Device Menu] ••••••••••••106
Fn key setting [Fn. Setting] ••••••••••••••••106
Memory select [Memory Select] ••••••••107
Sleep [Power Save] ••••••••••••••••••••••••••108
Time setting [Time & Date]••••••••••••••••108
USB setting [USB Settings]••••••••••••••••109
Setting reset [Reset Settings]••••••••••••111
Format [Format] ••••••••••••••••••••••••••••••113
Memory information [Memory Info.] •••115
System information [System Info.]••••••115

Chapter 7
About the PC

Using the recorder on your PC •••••••••117
The PC operating environment••••••••••117
Connecting to your PC••••••••••••••••••••••118
Disconnecting from your PC••••••••••••••119
Transferring voice files to your PC ••••••120
Using the recorder as a
USB microphone/speaker ••••••••••••••121
Using the recorder as an
external memory for your PC ••••••••••121

Chapter 8
For Quick Reference

Alarm message list••••••••••••••••••••••••123
Troubleshooting••••••••••••••••••••••••••••125
Accessories (optional)••••••••••••••••••••127
Glossary ••••••••••••••••••••••••••••••••••••••128
Specifications ••••••••••••••••••••••••••••••129
Technical assistance and support •••••134

Safety precautions

Before using your new recorder, read this manual carefully to ensure that you know how to operate the recorder safely and correctly. Be sure to keep this manual on hand so that you can refer to it at any time.

Important safety instructions

- Important safety instructions are indicated by symbols and text as shown below. Be sure to follow these instructions to protect yourself and others from personal injury or damage to property.
- The meanings of the symbols are as shown below.

⚠Danger

This sign indicates that incorrect handling could lead to serious danger causing death or severe injury.

⚠Warning

This sign indicates that incorrect handling could lead to death or severe injury.

⚠Caution

This sign indicates that incorrect handling could lead to injury or property damage.

Instructions for use

- Do not leave the product where it will be subject to high temperatures and/or humidity such as in a car parked in direct sunlight or at the seashore in summer.
- Do not store the product in a humid or dusty place.
- If the product gets wet, immediately wipe water off with a dry cloth. Especially avoid salt.
- Do not use organic solvent such as alcohol or thinner for cleaning.
- Do not place the product on or near a television set, refrigerator, or other electric appliance.
- Ensure that no sand or mud gets on the product. Sand or mud may cause irreparable damage.
- Do not apply strong vibration or shock to the product.
- Do not use the product where it will get wet.
- Do not put a magnetic card (such as bank card) near the speaker or headphones. Data recorded in the magnetic card may be damaged.
- When installing a tripod, rotate the screws on the tripod rather than the recorder.

<Notes on data loss>

- Data recorded in the memory could be damaged or erased due to a wrong operation, device failure, repair or other cause. It is recommended to save important data in the hard disk of your PC or media such as MO for backup.
- Olympus bears no liability for any damage or lost earnings incurred by data loss due to a failure, repair by a third party not certified by Olympus, or other reason.

<Notes on record files>

- Olympus bears no liability even if a record file is erased or becomes unplayable due to a failure of the recorder or PC.
- Recorded contents can be used for personal use only. It is prohibited by the Copyright law to use copyrighted work for other purposes without permission from the owner.

Recorder

⚠Warning

- **Do not use the product where there may be flammable or explosive gas in the air.**
  Doing so could cause an ignition or explosion.
- **Do not use or store the product for a long time where there is a lot of dust, humidity, oil, smoke, or steam.**
  Doing so could cause a fire or electric shock.
- **Do not disassemble, repair, or modify the product.**
  Doing so could cause an electric shock or injury.
- **Do not touch the operating AC adapter or the recharging battery for a long time.**
  The AC adapter and battery become hot during recharge. Touching these for a long time could cause a low temperature burn.
- **Always use the dedicated Olympus lithium ion battery and AC adapter.**
  Using another product could cause a fire or electric shock due to heat generation, deformation or other reason. In addition, the recorder or power supply could fail or an unexpected accident could occur. Note that damage caused by using an uncertified product will not be compensated for.
- **If the product falls into water or if water, metal or a flammable foreign object gets into the product, perform the following steps:**
  ① Immediately remove the battery.
  ② Contact your dealer or the Olympus Service Station for service. Continuing to use it could cause a fire or electric shock.
- **Do not insert a card other than SD, SDHC or SDXC card into the recorder.**
  If you accidentally insert such a card, do not try to forcibly remove it but contact our repair center or service station.
- **Do not operate the product while driving a vehicle (such as bicycle, motorbike or car).**
  Doing so could cause a traffic accident.
- **Do not leave the product within the reach of infants or children.**
  When using the product near them, take extra care and do not carelessly leave the product unattended. Children cannot understand warnings and cautions. In addition, the following accidents could happen:
  – Accidentally wrap the headphone cord around the neck and suffocate
  – Perform a wrong operation, causing injury or electric shock
- **Avoid using the product in an airplane, hospital, or other place where use of electric devices is restricted. Or, follow the instructions given at the site.**
- **When carrying the recorder by a strap, ensure that it does not get caught on other items.**

⚠Caution

- **Do not turn the volume up before starting operation.**
  Doing so could cause a hearing problem or hearing loss.
- **Stop using the product if you notice an abnormality such as unusual odor, abnormal sound, or smoke.**
  Continuing to use the product could cause a fire or burn. Immediately remove the battery carefully not to get burned and contact your dealer, our repair center or service station (Do not touch the battery with bare hands when removing it. In addition, remove the battery outdoors away from combustible materials).
- **Do not leave the product where it will be subject to high temperatures.**
  Doing so could cause deterioration of parts or a fire.
- **Do not touch the metal part of the product for a long time when the ambient temperature is low.**
  Doing so could damage your skin. Avoid touching the product with bare hands if possible and use gloves or other protective gear at low temperatures.

Battery

⚠Danger

- Do not put the battery near fire.
- Do not throw the battery into fire or heat it.
  Doing so could cause a fire, blowout or ignition.
- Do not directly solder, deform, modify or disassemble the battery.
- Do not connect the positive and negative terminals.
  Doing so could cause heat generation, electric shock or fire.
- When carrying or storing the battery, always put it into the case to protect the terminals. Do not carry or store it with a key chain or other metal item.
  Doing so could cause heat generation, electric shock or fire.
- Do not directly connect the battery to the power outlet or the slot of car cigarette lighter.
- Do not use or leave the battery at a place with high temperatures such as under direct sunlight, in the car in the hot sun, or near a heater.
  Doing so could cause a fire, burn or injury due to liquid leak, heat generation, blowout or other reason.

⚠Warning

- Do not touch or hold the battery with wet hands.
  Doing so could cause an electric shock or failure.
- Do not use a battery whose package is scratched or damaged.
  Doing so could cause a blowout or heat generation.
- Do not leave the battery within the reach of infants or children.
  They could swallow the battery. If this happens, immediately consult with a doctor.
- If you notice an abnormality such as abnormal sound, abnormally high temperature, burnt odor or smoke during use, perform the following steps:
  ① Immediately remove the battery carefully.
  ② Contact your dealer or the Olympus Service Station for service. Leaving it could cause a fire or burn.
- Do not soak the battery in freshwater or seawater or let the terminals get wet.
- Stop using the battery if you notice discoloration, deformation, or other abnormality.
- If recharging is not complete after the specified recharging time, stop recharging.

⚠Caution

- Using an unauthorized battery could cause an explosion (or blowout). Dispose of the used battery according to “Disposal of rechargeable battery” (☞ P.9) in this manual.
- Do not apply a strong shock to the battery or throw it.
- When using the battery for the first time or after not using it for a long time, be sure to recharge it before use.
- The battery has a fixed durability. If the battery quickly runs out even after being recharged under specified conditions, replace it with a new one.

AC adapter

⚠Warning

- Do not disassemble, repair, or modify the AC adapter.
  Doing so could cause an electric shock or injury.
- Do not use the AC adapter near flammable gas or material (such as petrol, benzin or thinner).
  Doing so could cause an explosion, fire or burn.

- Do not short-circuit the positive and the negative terminals of the plug.
  Doing so could cause a fire, burn or electric shock.
- If the interior is exposed due to being dropped or damaged, perform the following steps:
  ① Do not touch the exposed interior. Doing so could cause an electric shock, burn or injury.
  ② Immediately pull out the power supply plug from the outlet, being careful not to receive an electric shock, burn or injury.
  ③ Contact your dealer or service station for service. Leaving it could cause a fire or burn.
- If the AC adapter falls into water or if water, metal or a flammable foreign object enters into the product, perform the following steps:
  ① Pull out the power supply plug from the outlet.
  ② Contact your dealer or service station for service. Continuing to use it could cause a fire or electric shock.
- If you notice an abnormality such as abnormal sound, abnormally high temperature, burnt odor or smoke during use, perform the following steps:
  ① Immediately remove the battery carefully
  ② Contact your dealer or service station for service. Leaving it could cause a fire or burn.

⚠Caution

- Do not touch or hold the AC adapter with wet hands.
  Doing so could cause an electric shock or failure.
- Do not use the AC adapter at a voltage other than the indicated supply voltage.
- Do not insert a dusty power supply plug into the outlet.
- Do not use the AC adapter when the power supply plug is not completely inserted into the outlet.
- Do not pull out the power supply plug from the outlet when not in use.
- Do not damage the power supply cord.
  - Do not pull the cord to remove the power supply plug from the outlet.
  - Do not place a heavy object on the cord.
  - Do not place the cord near a heater.
  - Doing so could cause a fire or electric shock.

Disposal of rechargeable battery

- Used rechargeable batteries are valuable resources. When you dispose of a rechargeable battery, insulate the positive and negative terminals with tape or other material and bring them into your nearest shop that accepts rechargeable batteries for recycling purposes.
  For details, visit the Web site of JBRC (http://www.jbrc.com).

Li-ion 00

XLR/standard phone combo jack

- Do not remove or insert the XLR/standard phone combo jack while the recorder is recording or in stand-by for recording. Doing so could result in a large noise, possibly causing a hearing problem or hearing loss.

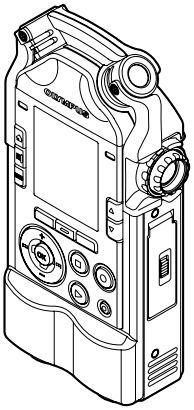
Notes on the external CD/DVD drive

- Please note that Olympus does not guarantee to customers the operation of a CD/DVD drive. In addition, owing to changes to each manufacturer's specifications, the CD/DVD drive may no longer be recognized properly in some cases.
- Be sure to operate an external CD/DVD drive using an AC power supply. Write operations will not be stable if the CD/DVD drive is run from the recorder's power supply.

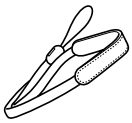
Checking Accessories

The accessories shown below come with the purchased product. Contact your dealer if any accessory is missing or damaged.

Recorder



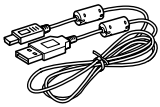
Strap



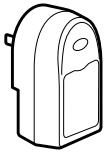
Lithium ion battery
(LI-50B)

Manual

USB cable

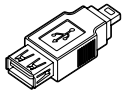


USB AC adapter
(A514)



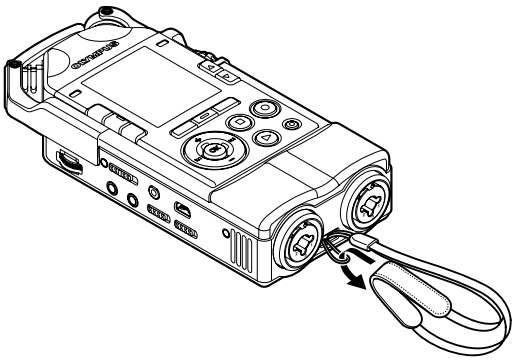
The AC plug is included.

USB conversion
connector



- Contents may vary depending on purchase location.
- Warranty differs depending on purchase location. Warranty card may not be included.

How to attach the strap



Chapter 1

Overview of Recorder

Main Features

High performance directional stereo microphone and quality amplifier circuit

The newly designed stereo condenser microphone enables you to record live quality sound. Our devotion to circuit design has realized separation of audio and system boards and independent power supplies to each board, and consequently, achieves a low noise and a high S/N ratio. Supporting the minimum frequency characteristic of 20 Hz, this recorder can reproduce the low frequency band much better than conventional models. In addition, the design, which is highly resistant to sound pressure, with the upper limit of 140dBSPL, enables you to record loud rock music without sound distortion.

Linear PCM 96kHz/24bit recording

The supported recording format is the linear PCM format with a sampling rate of 96 kHz and a bit count of 24 bits. High-resolution recording superior to music CD (44.1kHz/16bit) has been realized.

Multi-track recording and editing

The multi-track recording mode allows you to separately record instruments and voice and then edit and overlay each track. Up to eight tracks can be edited and played at the same time. You can also easily create music tunes.

XLR (24V/48V phantom power supply support)/ Standard phone combo jack

XLR (24V/48V phantom power supply support)/ Standard phone combo jack
Standard combo jack combined with a XLR external phone connector with phantom power supply support. Phantom power can be deactivated and is capable of operating at both 24V and 48V, and designed to reduce noise also when using extension cables.

Support for a variety of recording formats

This recorder supports overdubbing, synchronization (playing and recording at the same time) and voice synchronization recording in addition to the normal mode (usual recording). You can use this recorder in a wide range of applications such as field recording or when practicing an instrument.

Tuner function

This recorder has a mode that supports tuning of guitar and bass guitar in addition to the basic chromatic tuner. The reference tone "A" can be fine-tuned using the calibration function.

Metronome function

The metronome can be used as a rhythm guide during recording or when practicing an instrument.

Lissajous measurement function

This function detects the phase difference between the right and left microphones and the sound source. You can fine-tune their position and angle by checking the Lissajous waveform shown on the display.

Key shift to change octave

The octave of the sound source recorded in the multi-track mode can be adjusted with the key shift function.

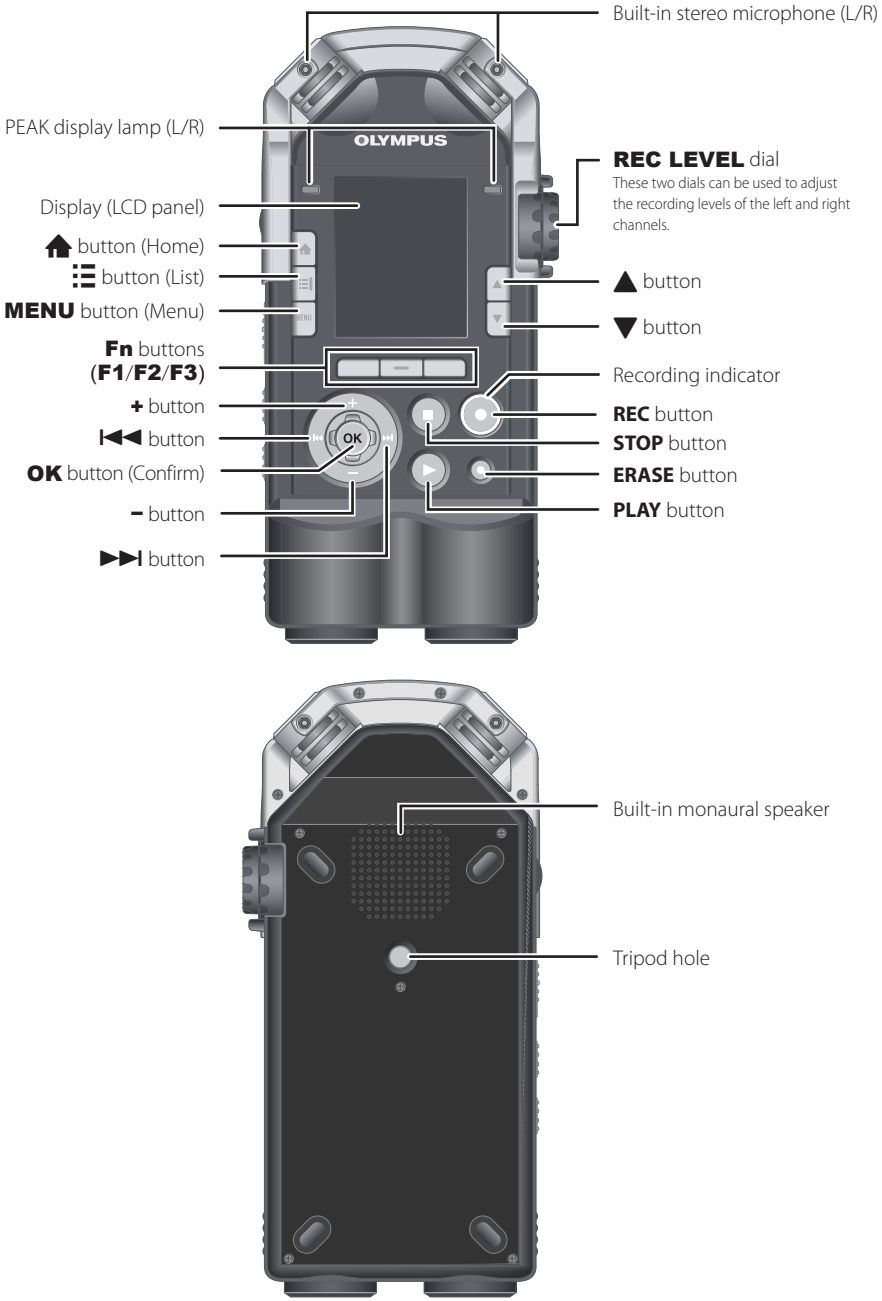
Audio CD output function

By connecting an external USB CD drive and the recorder, you can directly write recorded files into a CD.

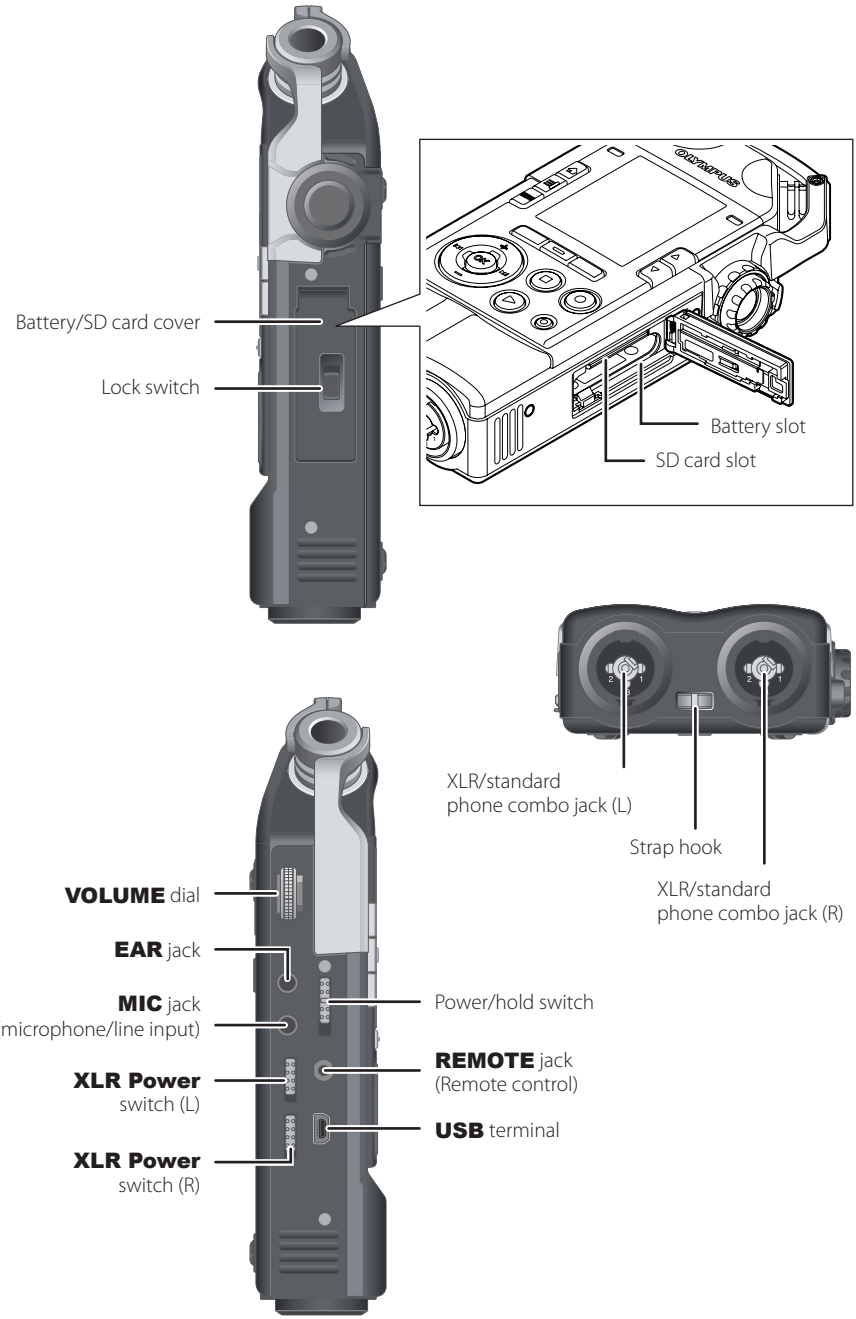
MP3 conversion function

The recorded PCM (WAV) data can be converted into an MP3 file in the recorder. This enables you to manage data in the easy-to-use format when writing it into a CD or attaching it to email.

Name of Each Part

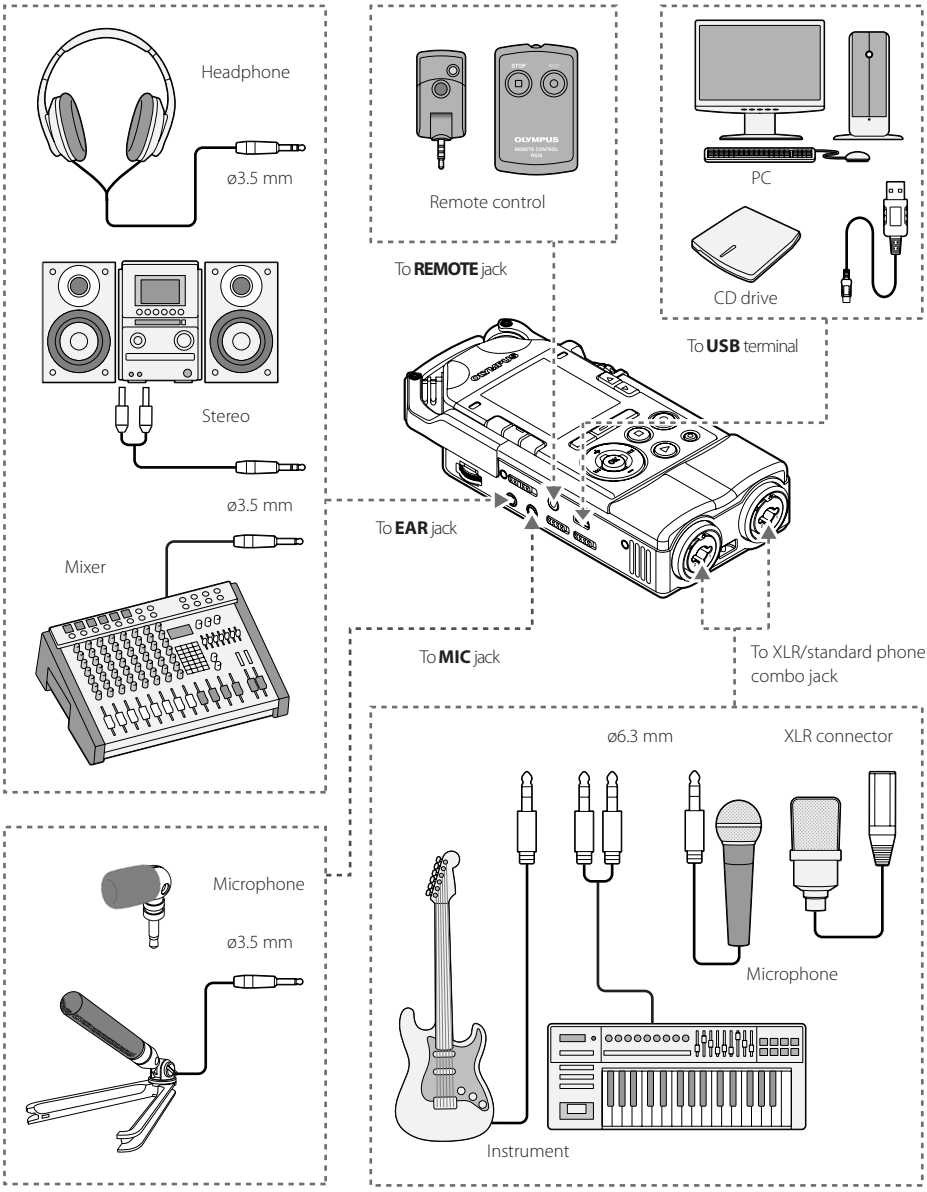


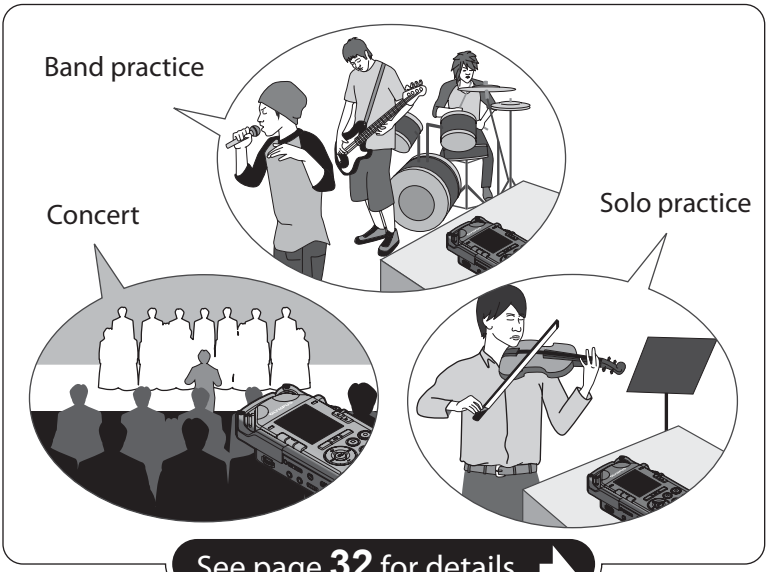
Name of Each Part



Connecting with External Devices

Connect commercially available external devices suitable for your situation.



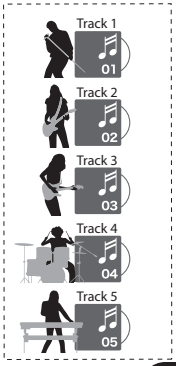
Recorder Mode

See page 32 for details.

Overdubbing

Record your singing while listening to a recording of instruments.
Dub over the previous recording to create a new file.

See page 39 for details.

Multi-Track Mode

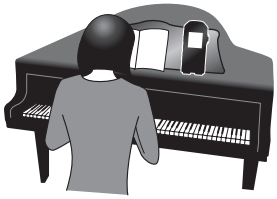


Record and edit each sound source separately, and mix them into a single file.

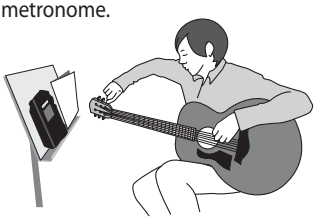
Save as a single file.

See page **53** for details.

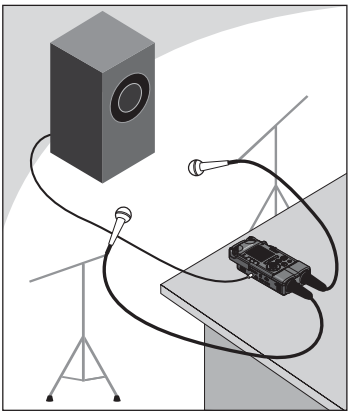
Tuner/Lissajous/Metronome Mode



Control your tempo with the metronome.



Perform accurate tuning according to the type of instrument.



Check the Lissajous waveform to determine the best position for microphones.

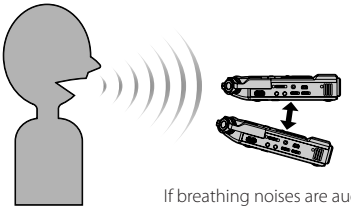
See page **66** for details.

Recording Tips for Each Instrument

Recorder position examples

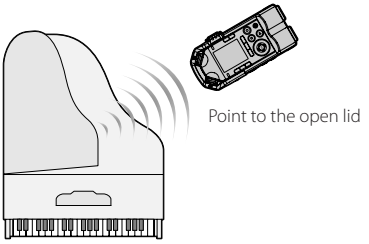
Voice

Position the recorder slightly away from the singer's face. If breathing noises are audible, adjust the filter settings.



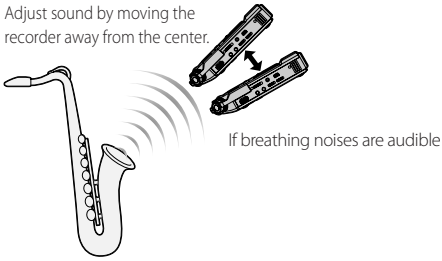
Piano

When recording the sound of a grand piano, position the recorder pointing to the center of the open lid. To record acousmato as well, move the recorder slightly away to get a richer sound.



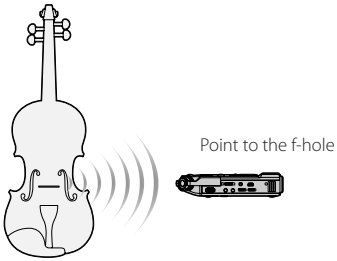
Wind instrument

Position the recorder pointing to the center of the so-called "bell." If breathing noises are audible, move the recorder slightly away from the center of the pavillon.



String instrument

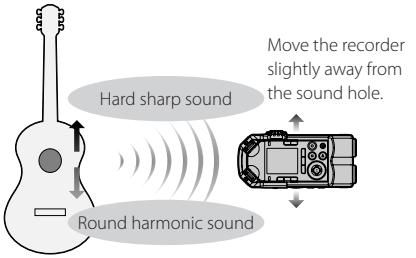
When recording the sound of a string instrument such as a violin, position the recorder slightly away from the upper part of the instrument, pointing to the f-hole of the body.



Recording Tips for Each Instrument

Acoustic guitar

Position the recorder pointing to a place slightly away from the sound hole of the guitar.For a rhythm guitar, keep a certain distance from the main body of the guitar. For solo or melody-focused music, move the recorder closer to the main body of the guitar during recording.

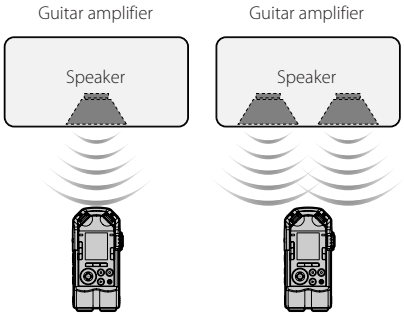


Hall

Place the recorder on the center line of the stage, with players also facing the direction of the microphone. Then, fix the recorder with a tripod or other tool before starting recording.

Electric guitar

To record sound directly from the speaker of a guitar amplifier, position the recorder slightly away from the speaker, pointing to the center of the speaker cone paper. To record sound from two speakers in stereo, position the recorder slightly away from the center between the left and right speakers.

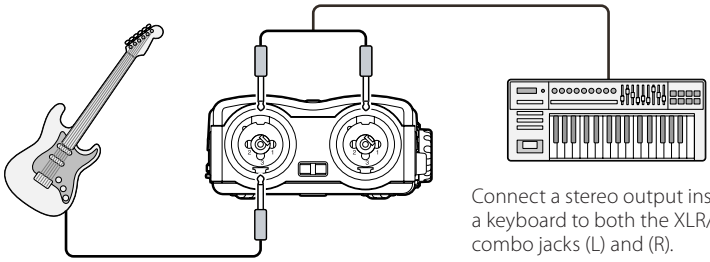


Connection of the XLR/Standard Phone Combo Jack and Phantom Power Supply

The guitar, bass guitar, keyboard and other instruments can be directly connected to the XLR/standard phone combo jack. Some settings are required when connecting a microphone that needs the phantom power supply, such as a condenser microphone.

Connecting the instruments

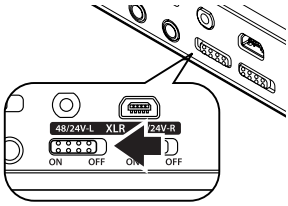
Connect a monaural instrument to the XLR/standard phone combo jack (L).



Connect a stereo output instrument such as a keyboard to both the XLR/standard phone combo jacks (L) and (R).

Connecting the microphone

Connect the dynamic or condenser microphone to the XLR/standard phone combo jack (L) or (R). If the phantom power supply is required, slide the **XLR Power** switch to [**ON**] on the XLR/standard phone combo jack to which the microphone is connected.



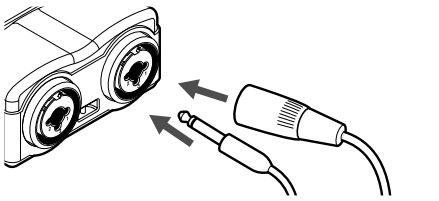
Notes

- Operation will be unavailable during recording.
- The recording function will be unavailable for three seconds after the **XLR Power** switch is turned on.

- For details on the settings, refer to "**Microphone power source [Mic Power]**" (☞ P. 83).
- Slide the **XLR Power** switch to [**OFF**] if the condenser microphone that needs the phantom power supply is not connected.

XLR/standard phone combo jack

The XLR/standard phone combo jacks of the recorder support the XLR type and standard type plugs.



Standard type (unbalanced) XLR type

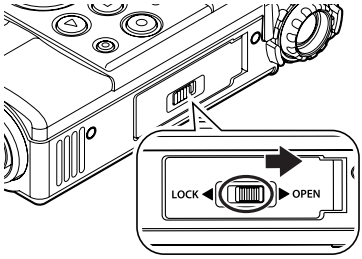
Chapter 2

Startup

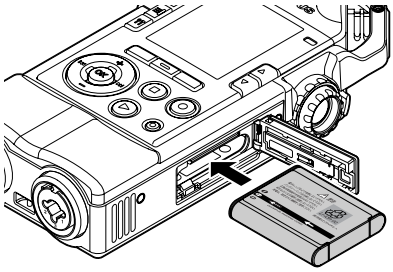
Inserting the battery

Use one Olympus lithium ion battery (LI-50B). Other batteries are not supported.

1 Slide the lock switch to [**OPEN**] to open the battery cover.



2 Insert the battery.



- Insert the battery so that the direction of the arrow (label) on the recorder matches the direction of the arrow on the battery.

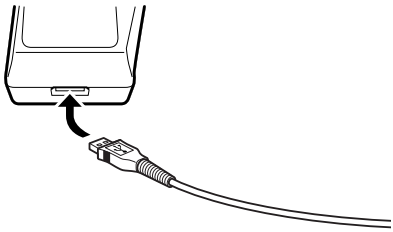
3 Close the battery cover.

- After closing the battery cover, slide the lock switch to [**LOCK**].

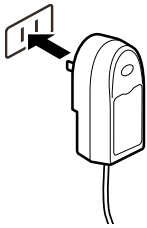
Recharging the battery

Connecting the recorder to the USB AC adapter for recharge

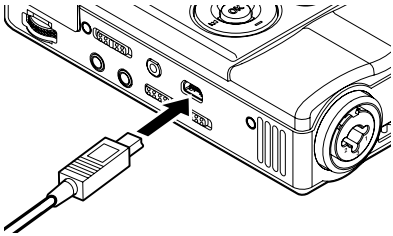
1 Connect the USB cable to the USB terminal of the AC adapter.



2 Connect the AC cable to the AC adapter and the AC adapter to the household power supply outlet.



3 Connect the USB cable to the USB terminal of the recorder.



- The PEAK display lamp (R) lights up in orange and recharging starts.

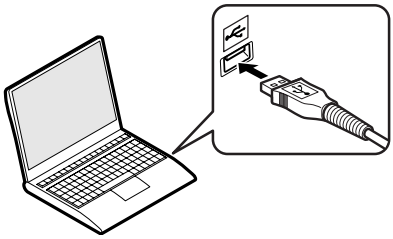
Connecting the recorder to a PC with the USB cable for recharge

Notes

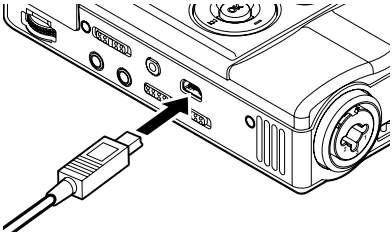
- When the unit's [**USB Class**] is set to [**Composite**] with the [**USB setting**], charging will not start (☞ P. 110).
- Stop or turn off the recorder before connecting the USB cable.

1 Start up the PC.

2 Connect the USB cable to the USB port on the PC.



3 Connect the USB cable to the USB terminal of the recorder.



- The PEAK display lamp (R) lights up in orange and recharging starts.

Battery indicator

The battery indicator on the display changes as described below according to

the remaining battery level.

- When [ ] appears on the display, recharge the battery as soon as possible. When the battery runs out, [ ] and [**Battery low**] are displayed and operation stops.
- The battery indicator repeatedly appears during recharge.

Notes

- Always use the dedicated USB cable that is provided. Do not use a cable from another manufacturer. Doing so could cause a failure.In addition, do not connect the dedicated cable to another manufacturer's product.
- Carefully insert the battery facing the right direction.
- Be sure to turn off the recorder before replacing the battery. If the battery is removed while the recorder is operating, a failure could occur (For example, the recorder may become unable to play files).
- You may have to reset the time if the battery is removed from the recorder for 15 minutes or if the battery is repeatedly removed and inserted at short intervals (☞ P.27).
- Remove the battery if the recorder is not to be used for a long time.
- When you need a new battery, always purchase the Olympus lithium ion battery (LI-50B). Do not use a cable from another manufacturer. Doing so could cause a failure.
- When recharging the battery, turn on the PC and connect the recorder using the USB cable. The battery is not recharged if the PC is off or in the standby, hibernation or auto-power-off mode.
- Do not use the USB hub to connect to the PC when recharging the battery.
- The battery indicator shows [F] when recharging is complete (Recharging time: about three hours*).

  * This is the approximate time when recharging an empty battery to the full level at the room temperature.The recharging time varies depending on the remaining battery level, recharging state and other factors.
- If [C] or [H] is displayed, the battery cannot be recharged. The ambient temperature must be between 5 C and 35 C to recharge the battery.

  [C]: The ambient temperature is too low.

  [H]: The ambient temperature is too high.
- If the battery runs out very quickly even after being recharged to the full level, replace it with a new one.
- Securely insert the USB connector all the way in. The USB connector must be properly connected to operate normally.

Recharging

■Discharge:

Because the lithium ion battery has self-discharge characteristics, recharge the attached lithium ion battery before using the product for the first time.

■Operating temperature:

The battery is a chemical product. Although the battery performance varies even if the battery is used in the recommended temperature range, this variation is not a failure.

■Recommended temperature range:

When operating the recorder: 0 to 42 C

When recharging: 5 to 35 C

When storing the recorder for a long time: –20 to 30 C

Using the battery outside the above temperature range could cause performance deterioration or a shorter period of durability. If the recorder is not to be used for a long time, remove the battery prior to storage to prevent liquid leak or rust.

- A new battery or a battery that has not been used for a long time (one month or more) may not completely recharge due to the nature of lithium ion batteries. In such a case, repeatedly recharge and discharge the batteries a few times.
- Dispose of the battery according to applicable laws.When disposing of the battery without completely discharging it, insulate the battery terminals with tape or take other measures to prevent short-circuiting.
- When the unit's [**USB Class**] is set to [**Composite**] with the [**USB setting**], charging will not start (☞ P. 110).
- If the battery runs out and you cannot change the USB settings, connect the recorder via USB while pressing and holding the **STOP** button for around 10 seconds until a logo appears on the display. The setting will switch automatically to Storage allowing you to recharge the recorder.

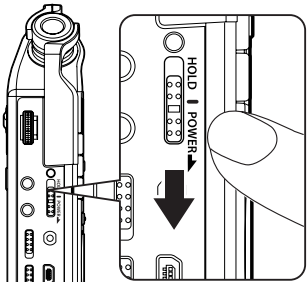
For customers in Germany:

Olympus has a contract with the GRS (Joint Battery Disposal Association) in Germany to ensure environmentally friendly disposal.

How to Use the POWER/HOLD Switch

Turning the power on

Slide the POWER/HOLD switch in the direction of the arrow.



• The home screen appears.

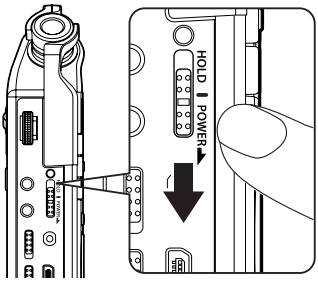
Sleep mode

If the recorder remains stopped for 10 minutes or more (initial setting), the display turns off and the recorder enters the sleep (power-saving) mode (☞ P.108).

To clear the sleep mode, slide the power/hold switch in the direction of the arrow to turn the power on again.

Turning the power off

Slide the POWER/HOLD switch in the arrow direction and keep it for one second or more.

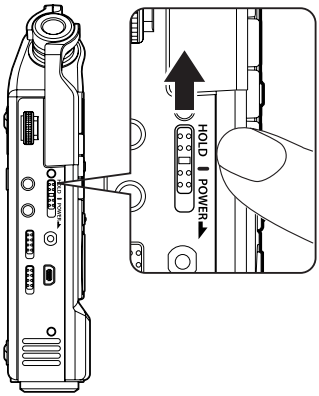


• The existing data or the settings for each mode are retained even after the power is turned off.

Activating the hold mode

In the hold mode, the recorder remains active but does not accept button operations. This allows you to safely carry the recorder because the recorder does not operate even if a button is accidentally pressed in your bag. This mode also prevents the recorder from accidentally stopping during recording.

Slide the POWER/HOLD switch to [**HOLD**].



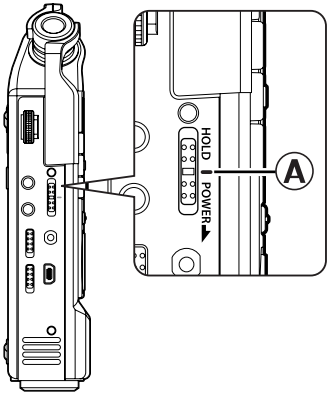
• [**HOLD**] appears on the display.

Notes

- If a button is pressed in the hold mode, the PEAK display lamp (R) flashes in orange but the recorder does not operate.
- If the hold mode is activated during playing (or recording), the recorder continues to play (record) sound (The recorder stops when playback ends or when recording ends owing to the memory becoming full).

Clearing the hold mode

Slide the POWER/HOLD switch to position Ⓐ.

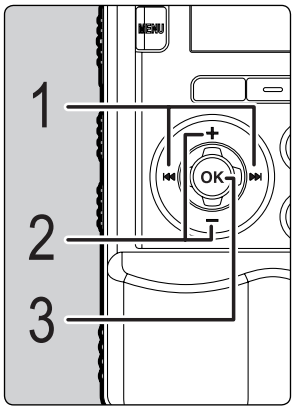


Setting the date and time [Time & Date]

When the date and time are set, the recording time information is automatically recorded for each file. Set the date and time in advance for easy management of recorded files.

When the recorder is turned on in the following cases, [Set time & date] is displayed.Set the clock according to the procedure below, beginning with step 1.

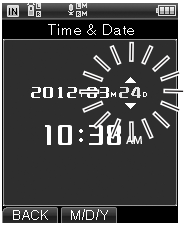
- When using the recorder for the first time
- When inserting the battery after not using the recorder for a long time
- When the clock has not been set



1 Select the setting item by pressing the ►►I/I◄◄ button.

- Select the item you want to set from "Year", "Month", "Day", "Hour", and "Minute" so that the item flashes.

2 Select the current date or time by pressing the +/− button.



- Repeat to select the next setting item with the ►►I/I◄◄ button and select the current date or time with the +/− button.

3 Press the **OK** button to complete setting.

- The recorder clock starts operating from the set date and time. Press the **OK** button in synchronization with the time signal or other clock.

- When you set "Hour" or "Minute", the time display format switches between the 12-hour format and the 24-hour format every time the **F2** button is pressed.

  Example: 10:38 p.m.

  10:38 p.m. (initial value) ⟷ 22:38

- When you set "Year", "Month", or "Day", the display order switches every time the **F2** button is pressed.

  Example: March 24, 2012

  2012 March 24 (initial value) → March 24, 2012 → 24 March 2012 → (initial value)

How to set the voice guide

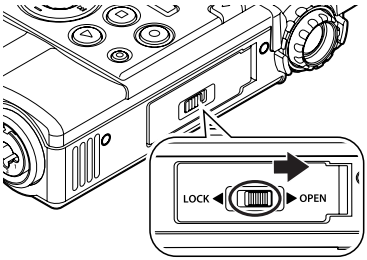
After the clock is set, the message [**Turn off the voice guide if you do not need it**] is played and [**Voice Guide**] (☞ P.104) is displayed. Select [**Off**] when you do not need the voice guide.

- The recorder is ready to use when the date/time and voice guide settings are complete. For how to use the recorder, refer to "**Let's use LS-100!**" (☞ P.16-17).

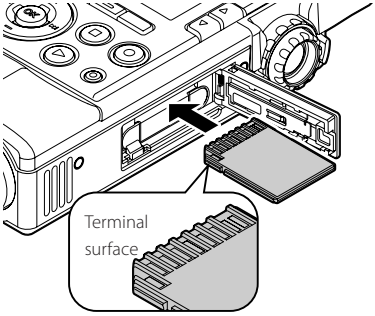
Inserting the SD card

"SD" in this manual refers to SD, SDHC and SDXC.
Commercially-available SD cards can be used in this recorder.

1 Slide the lock switch to [**OPEN**] when the recorder is stopped and open the SD card cover.



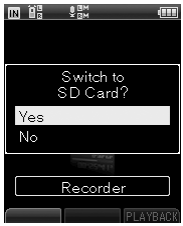
2 Insert the SD card.



- Insert the SD card with the terminal face facing up, as shown in the figure.
- If the SD card is inserted in the wrong direction or at an angle, the contact face may be damaged or the SD card may get stuck.
- Recording cannot start unless the SD card is inserted all the way in.

3 Close the SD card cover.

- After closing the SD card cover, slide the lock switch to [**LOCK**].
- When the SD card is inserted, the recording media switching screen appears.



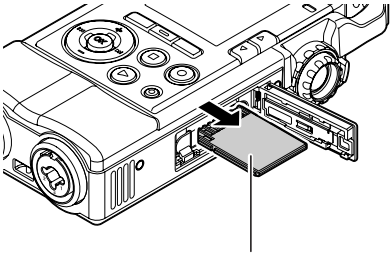
4 To record data in the SD card, select [**Yes**] by pressing the **+/−** button.

5 Press the **OK** button to complete setting.

Notes

- The recording medium can be switched to the built-in memory (☞ P.107).
- The recorder may not recognize an SD card formatted (initialized) on a PC or other device. Be sure to format your SD card on this recorder (☞ P.113).

Removing the SD card



Press the SD card all the way into the recorder and slowly pull it out.

- If [**SD card**] is selected in [**Memory Select**], the [**Internal memory selected**] message is displayed.

SD card

If the SD card is in the write protection mode, the [**SD card locked**] message is displayed.Clear write protection before inserting the card.

When the write protection switch is set to [**LOCK**], recording or other operations cannot be performed.

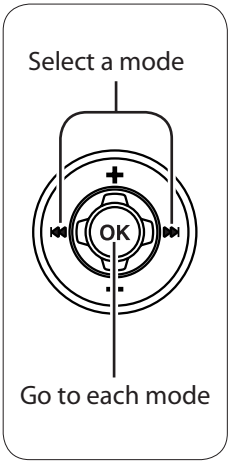
Notes

- When you remove the SD card, it may swiftly pop out if you suddenly take away your finger that was pushing the SD card or push the SD card out by flipping it.
- The recorder may not correctly recognize some SD, SDHC or SDXC cards depending on the manufacturer or card type due to compatibility.
- Be sure to read the attached SD card manual before use.
- If the SD card is not recognized, remove the SD card and then insert it again to see if the recorder recognizes it.
- The processing speed may become lower depending on the type of SD card. The processing performance may deteriorate if the SD card is repeatedly written to or deleted. In such a case, initialize the SD card again (☞ P.113).
- For the SD cards certified according to our standards, refer to the support page on our Web site:
  http://olympus-europa.com/

  Although the manufacturers and types of SD cards whose operation we have certified are listed on our Web site, operation of these SD cards is not guaranteed. Note that it may become impossible to correctly recognize a listed card due to specification changes by the manufacturer or other reason.

Operations on the Home Screen

When the recorder is turned on, the home screen appears.This recorder has the following five modes. Each mode can be accessed from the home screen. For each mode, refer to the relevant page.



[Recorder]☞ P.33

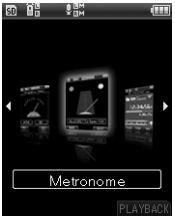
Normal, overdubbing , synchronization and voice synchronization recording are supported.

[Multitrack]☞ P.54

You can create a file overlaying instruments and voice.

[Tuner]☞ P.67

Use this function to tune your instrument.



[Metronome]☞ P.70

This recorder has a metronome function.

[Lissajous]☞ P.69

Use this function to detect and measure the phase difference between the microphone and the sound source.

Chapter 3

Recorder Mode

What You Can Do in the Recorder Mode

Recorder Mode

This recorder has four recording modes: [**Normal**], [**Overdub**], [**Play Sync**], and [**V-Sync. Rec**].You can select the appropriate mode for a wide range of recordings, such as recording of musical performances and field recording.

Normal

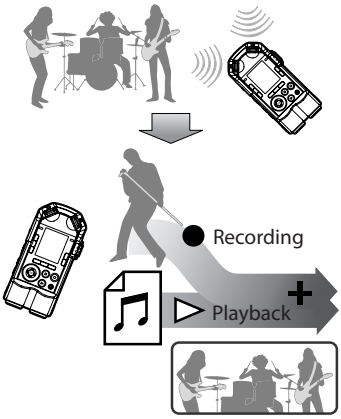
This is the normal mode of recording.

Usage Example:

Overdub

In this mode, you can easily dub over a previously recorded file.

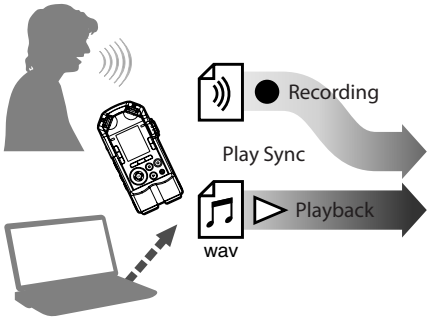
Usage Example:



Play Sync

This mode allows you to record only the input sound (of musical instruments, etc.) that is being played along with the playback of a previously recorded file.

Usage Example:



V-Sync. Rec

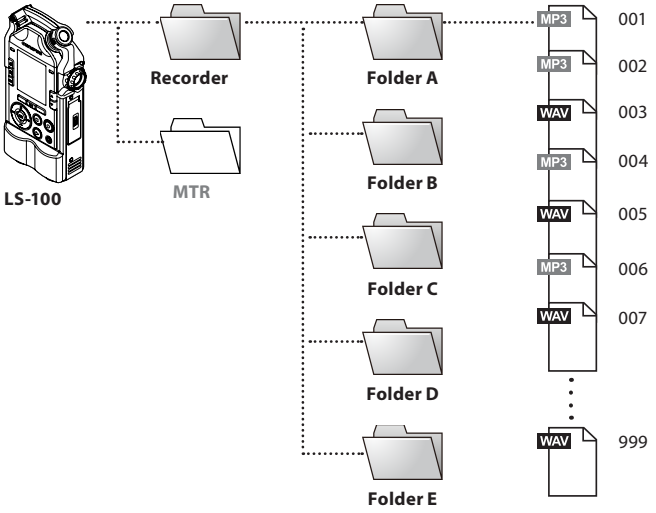
In this mode, recording starts automatically when a sound louder than the set voice sync level is detected.

Usage Example:

Files and Folders

Folders

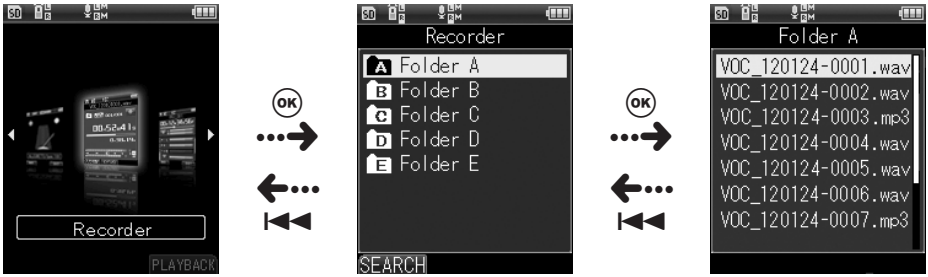
In the recorder mode, the recording folders [**Folder A**] through [**Folder E**] are available.



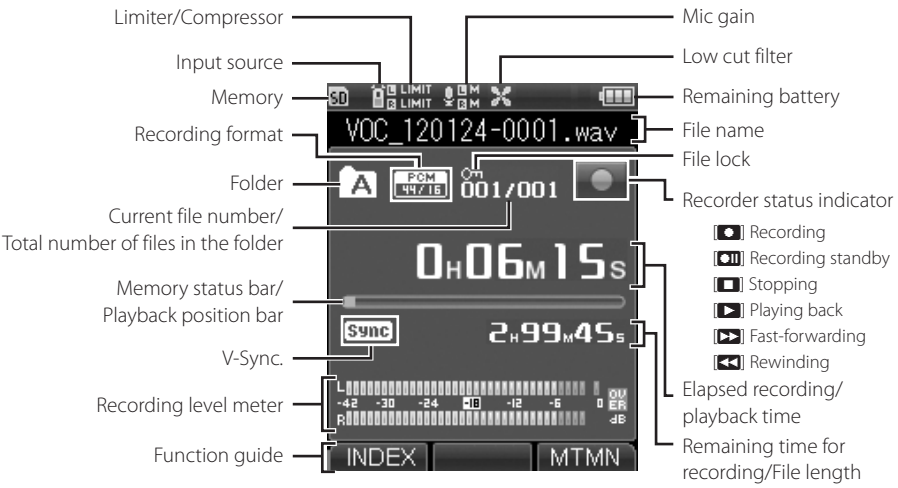
* Any files or folders directly under the [**Recorder**] folder will not be displayed on this recorder.

Selecting folders and files

Home Screen [**Recorder**] Folder List Screen File List Screen



File Screen



File name

VOC_ 120201- 0001 .wav

① ② ③ ④

① **User ID:**
This is the user ID of this device.

② **Recording date:**
The date of recording is represented by 6 digits.
Ex: "120201" represents February 1st of 2012.

③ **File number:**
A serial number automatically assigned by a Digital Voice Recorder.

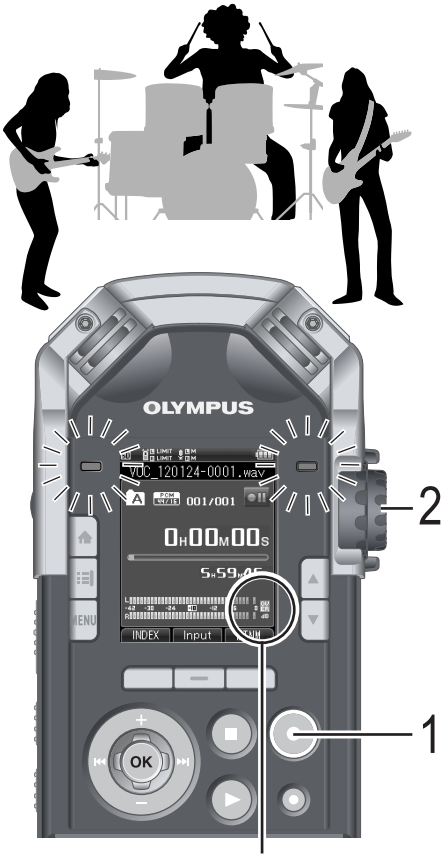
④ **Extension:**
File extensions indicate the recording format.

- Linear PCM format .wav
- MP3 format .mp3

To achieve a good recording quality, it is important to properly adjust the settings, including the [**Mic Gain**] of the input source (☞ P. 80) and the [**Rec Level**] (☞ P. 81).

Adjusting the recording level properly

Recorded sound will be distorted if the recording level meter swings all the way to the right, or the PEAK indicator (R) lights in orange. Adjust the recording level so that the recording level meter does not exceed [**-6dB**].



The level meter is maxed out (the sound will be distorted).

1 Press the **REC** button to enter the recording standby mode.

- The recording indicator and [⏺II] on the display will flash, and the device enters the recording standby mode.

2 Adjust the recording level with the **REC LEVEL** dial.

- Adjust the **REC LEVEL** dial according to the sound source.

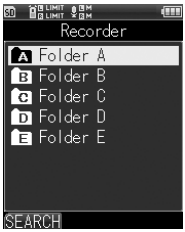
- The **REC LEVEL** dial can separately adjust the level of the input source for the L/R channels. The larger the number is, the higher the recording level is, and the more the level meter is pushed further to the right.
- Recording when the level meter is way past the peak may result in noise, even if the [**Rec Level**] is set to [**Auto**] or [**Limiter On**] (☞ P. 81). Make a test recording to see if the recording level is set properly.

Recording

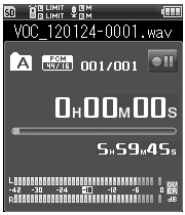
Before starting to record, select a folder from [**Folder A**] through [**Folder E**]. We recommend that you selectively use the folders to organize your recordings based on their contents.

Normal Recording [Normal]

1 Select a folder for recording.

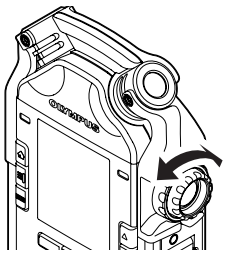


2 Press the **REC** button to enter the recording standby mode.



3 Adjust the recording level.

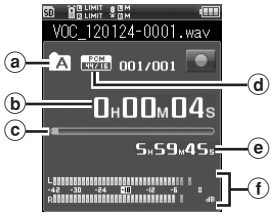
- Adjust the **REC LEVEL** dial according to the sound source.



Adjust the recording level.

4 Press the **REC** button to start recording.

- [●] appears on the display, and recording starts.

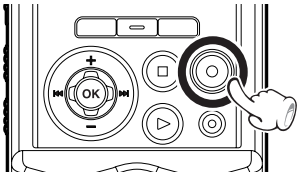


ⓐ Recording folder
ⓑ Elapsed recording time
ⓒ Memory status bar
ⓓ Recording format
ⓔ Remaining time for recording
ⓕ Recording level meter

5 Press the **STOP** button to stop recording.

Pausing the recording

Press the **REC** button during recording.

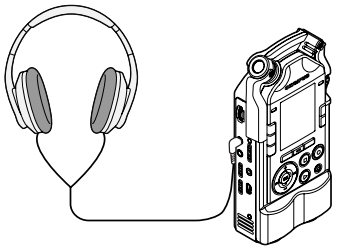


- [⏺II] will appear on the display.
- The recording standby mode will be released after two hours, and the recorder will enter the stop mode.
- To resume recording, press the **REC** button again.

Listening to the sound being recorded (Recording monitor)

Connect headphones to the **EAR** jack of the recorder, and you can listen to what is being recorded. The monitoring volume can be adjusted with the **VOLUME** dial.

- Please set the [**Rec Monitor**] to [**On**] beforehand (☞ P. 87).



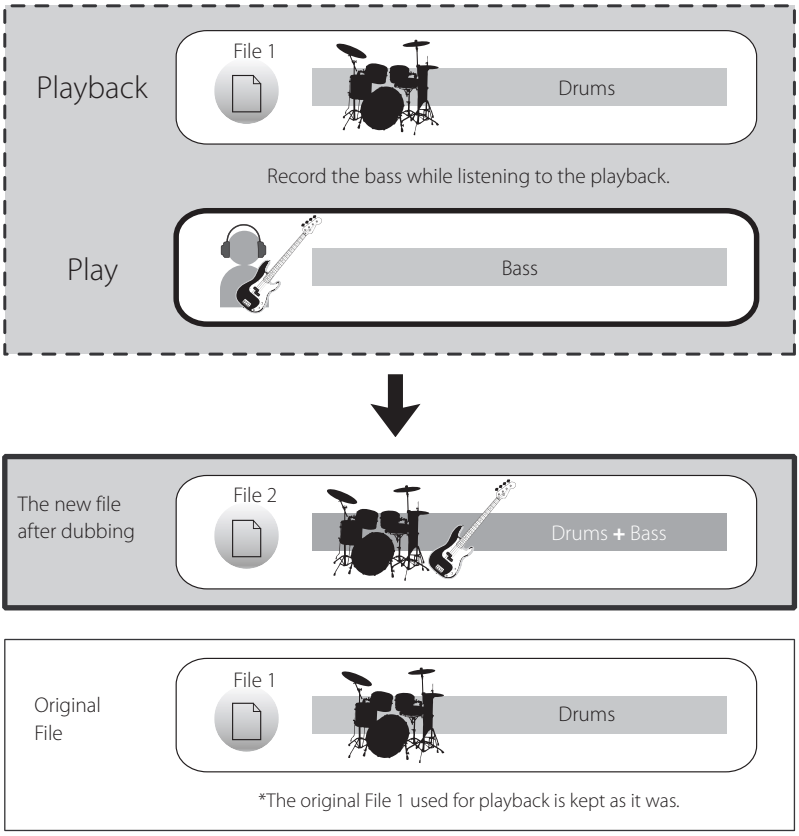
Notes

- To protect your ears, turn the volume down to [**0**] before putting on the headphones.
- To avoid feedback, do not bring the headphones near the microphone during recording.
- Changing the monitoring volume does not affect the recording level or the mic gain.

Overdubbing [Overdub]

In this mode, you can easily dub over a previously recorded file. This is handy when you create music or practice musical instruments, since it allows you to dub a new track over a file that is being played back.

Usage Example

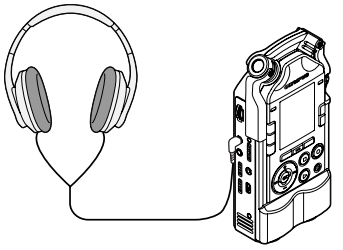


You can dub a new track over sound sources that have been recorded part by part. Therefore, this mode lets you enjoy building a song by gradually adding parts, such as drums, base, guitar, and vocal.

- Recording and playback in the Over Dub mode are available only when the [**PCM 44.1kHz/16bit**] recording format is used.

1 Set the [**Rec Mode**] to [**Overdub**] (☞ P. 79).

2 Connect headphones to the **EAR** jack of the recorder.



• The file to be dubbed over will be played back through the **EAR** jack.

3 Select a file to dub over (☞ P. 34, 45).

4 Press the **PLAY** button to start playback.

5 Press the **REC** button to enter the recording standby mode.

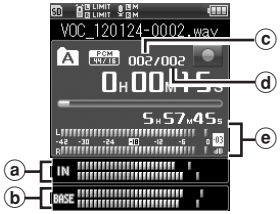
• Playback of the file will continue.

6 Adjust the recording level.

• Adjust the recording level to balance it with the playback file.

7 Press the **REC** button to start recording.

• Playback will start from the beginning of the file.
• Recording of the input sound and playback of the file will start simultaneously.



ⓐ Level of the input sound to be recorded
ⓑ Level of the output sound that is being played back
ⓒ Overdubbing file number
ⓓ Total number of files in the folder
ⓔ Recording level meter

8 Press the **STOP** button to stop recording.

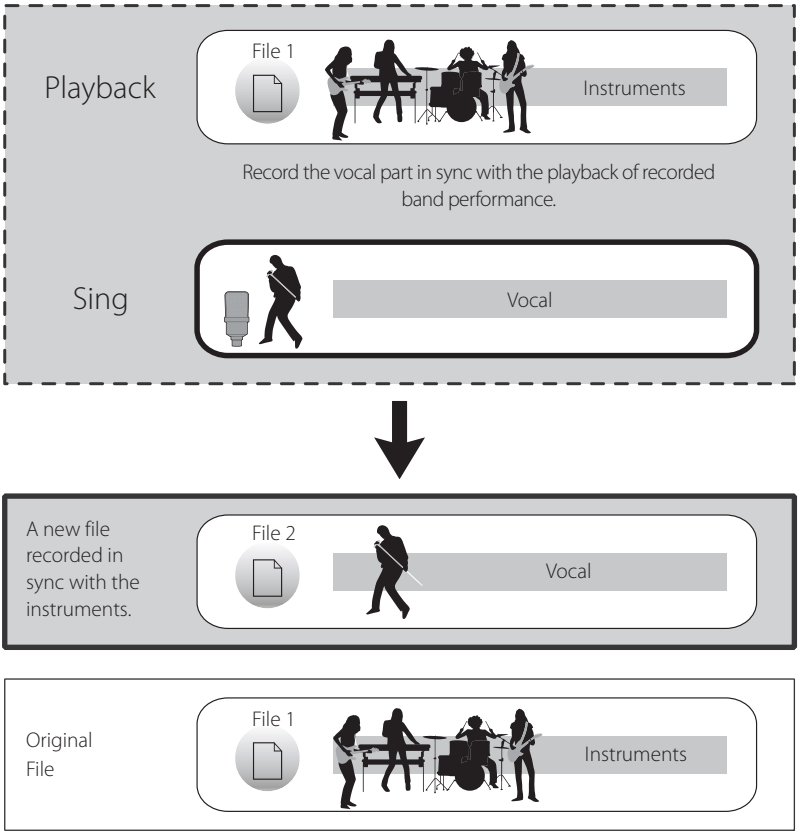
Notes

• Dubbed files will be saved with different names.
• By stopping the playback file you will also stop the recording file.

Play Sync [Play Sync]

The Play Sync mode allows you to record only the input sound that is being played along with the playback of a previously recorded file.

Usage Example

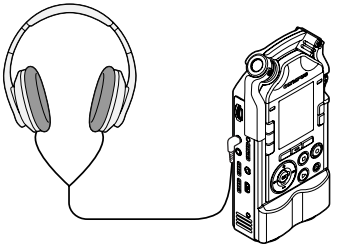


You can record your part while listening to the playback of a different part for reference. This is ideal for practicing your part, since it lets you check the pitch and tempo on the recorded file.

- Recording and playback in the Play Sync mode are available only when the [**PCM 44.1kHz/16bit**] recording format is used.

1 Set the [**Rec Mode**] to [**Play Sync**] (☞ P. 79).

2 Connect headphones to the **EAR** jack of the recorder.



• The file for sync recording will be played back through the **EAR** jack.

3 Select a file for sync recording (☞ P. 34, 45).

4 Press the **PLAY** button to start playback.

5 Press the **REC** button to enter the recording standby mode.

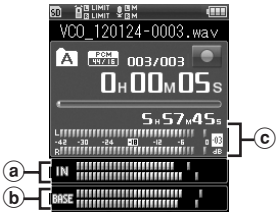
• Playback of the file will continue.

6 Adjust the recording level.

• Adjust the recording level to balance it with the playback file.

7 Press the **REC** button to start recording.

• Playback will start from the beginning of the file.



ⓐ Level of the input sound to be recorded
ⓑ Level of the output sound that is being played back
ⓒ Recording level meter

8 Press the **STOP** button to stop recording.

Note

• By stopping the playback file you will also stop the recording file.

Voice Sync Recording [V-Sync. Rec]

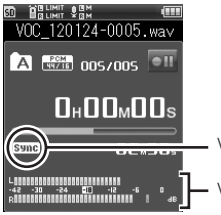
Voice sync recording is a feature that automatically starts a recording when the recorder detects a sound louder than the voice sync level (detection level) setting; when the sound level decreases, recording stops automatically.

1 Set the [**Rec Mode**] to [**V-Sync. Rec**] (☞ P. 79).

2 Press the **REC** button to enter the recording standby mode.

3 Press the ▶▶I/I◀◀ button to adjust the voice sync level.

- The voice sync level will be shown in 15 steps on the display.
- The higher the value, the more sensitive and easily activated the recorder becomes; at a higher setting, even a small sound will activate recording.



4 Press the **REC** button again to start recording.

- The recorder will enter the recording standby mode. [**Standby**] will flash in the display, and the recording indicator light will flash.
- When the recorder receives an input at or above the voice sync level, it automatically starts a recording.

5 Voice sync recording stops automatically.

- If [**Mode**] setting of the [**V-Sync. Rec**] is set to [**One time**], the recorder will close the file after recording, and enter the recording stop mode (☞ P. 79).
- If [**Mode**] setting of the [**V-Sync. Rec**] is set to [**Continuous**], the recorder will close the file after recording, and enter the recording standby mode. Upon detecting a sound, it will start recording in a new file (☞ P. 79).
- To manually stop the voice sync recording, press the **STOP** button.

Recording using the metronome

You can use the metronome to help you keep accurate tempo during recording.

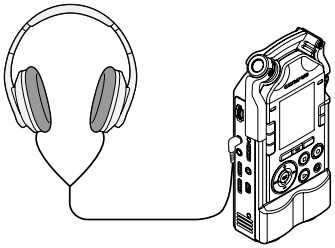
1 Set [**REC Mode**] to [**Normal**] (☞ P. 79).

2 Set [**Metronome Menu**] to [**On**] (☞ P. 100).

3 Select [**Setting**] and set [**Display**] to [**On**] (☞ P. 100).

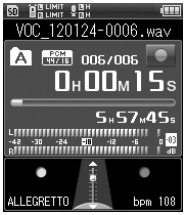
- You can change the tempo and pattern of the metronome in [**Setting**] under [**Metronome Menu**].

4 Connect headphones to the **EAR** jack of the recorder.



5 Press the **REC** button to start recording.

- If [**Countdown**] is set, recording starts after the set count.



6 Press the **STOP** button to stop recording.

- When you stop recording, the metronome will stop as well.

Important Notes on Recording

- When you have an SD card inserted in the recorder, make sure to check if your memory selection is set to [**Internal memory**] or [**SD card**] (☞ P. 107).
- To prevent losing the beginning of your recording, make sure the recording indicator is lit before recording.
- When the remaining recording time is down to 60 seconds, the PEAK indicator light (R) starts flashing; as the time winds down (to 30 seconds, 10 seconds, etc.), the light starts to flash faster.
- No more recordings can be made when [**Folder full**] appears. Select another folder, or delete unnecessary files before continuing to record (☞ P. 50).
- No more recordings can be made when [**Memory full**] appears. Delete unnecessary files before continuing to record (☞ P. 50).
- The performance of the recording medium may decrease after repeated writing and erasing. When this occurs, try formatting the recording medium (☞ P. 113).

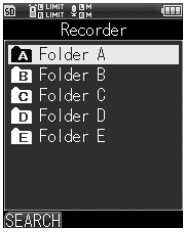
Searching for files

You can search for recording files by date. Using the recording date to narrow down your search, you can quickly find the file you are looking for.

1 [**Home**] ➔ [**Recorder**]

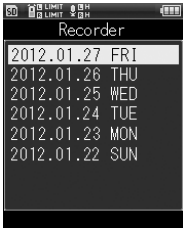
2 Press the **OK** button.

• Enter the folder list screen.

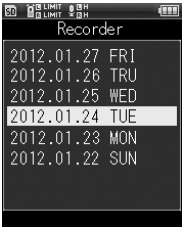


3 Press the **F1** (SEARCH) button.

• Enter the date list screen.

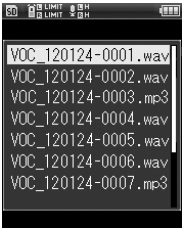


4 Select the recording date with the **+/−** button.



5 Press the **OK** button.

• You will get a list of files that were recorded on the date you specified.



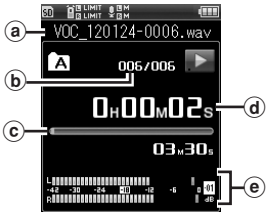
6 Select the file with the **+/−** button.

Playback

This recorder can play files it has recorded as well as WAV and MP3 format files transferred from other machines.

1 Select the file to play back (☞ P. 34, P. 45).

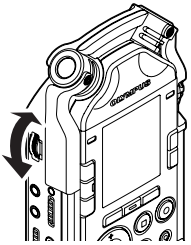
2 Press the **PLAY** button to start playback.



- [▶] will appear on the display.

ⓐ File name
ⓑ File number
ⓒ Playback position bar
ⓓ Elapsed playback time
ⓔ Output level meter

3 Adjust the listening volume to a comfortable level with the **VOLUME** dial.



- The higher you set the number on the dial, the louder the volume will be.

4 Press the **STOP** button to stop playback.

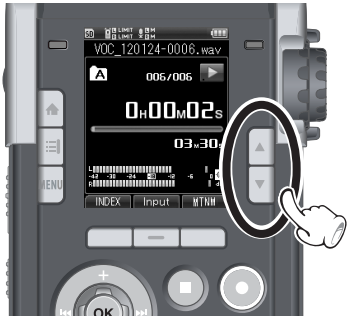
- [■] will appear on the display.
- Playback of the file will stop.

- If you switch to the Home screen during playback, you can return to the playback screen by pressing the **F3** (PLAYBACK) button.

Changing the playback speed

The playback speed can be changed between [**50%**] and [**400%**] without affecting the pitch. Change it as necessary.

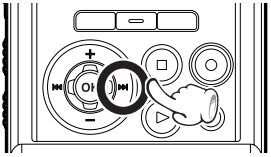
Change the playback speed with the ▲/▼ button.



Note

- Variable bit rate MP3 files (in which conversion bit rates vary within a file) may not play back properly.

Fast-forwarding



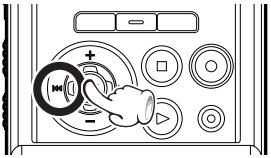
Press and hold the ▶▶I button when the recorder is stopped.

- Fast-forwarding stops once you release the ▶▶I button. Press the **PLAY** button to start playback from where it was stopped.

Press and hold the ▶▶I button when a file is being played back.

- Playback resumes from that position once you release the ▶▶I button.
- If an index mark is placed in a file, playback stops at that position (☞ P. 48).
- The recorder stops when it reaches the end of a file. If you keep pressing the ▶▶I button, the recorder continues fast-forwarding from the beginning of the next file.

Rewinding



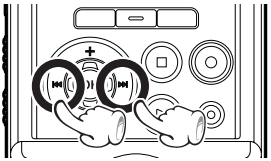
Press and hold the I◀◀ button when the recorder is stopped.

- Rewinding stops once you release the I◀◀ button. Press the **PLAY** button to start playback from where it was stopped.

Press and hold the I◀◀ button when the recorder is playing back a file.

- Playback resumes from that position once you release the I◀◀ button.
- If an index mark is placed in a file, playback stops at that position (☞ P. 48).
- The recorder stops when it reaches the beginning of a file. If you keep pressing the I◀◀ button, the recorder continues rewinding from the end of the previous file.

Skipping to the beginning of a file



Press the ▶▶I button when the recorder is in the stop or playback mode.

- It skips to the beginning of the next file.

Press the I◀◀ button when the recorder is playing back a file.

- It skips to the beginning of the current file.

Press the I◀◀ button when the recorder is stopped.

- It skips to the beginning of the previous file. When a file is stopped in the middle, the recorder skips to the beginning of the file.

Press the I◀◀ button twice when a file is being played back.

- The recorder skips to the beginning of the previous file.

Notes

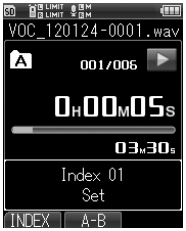
- If an index mark is placed in a file and you try skipping to the beginning of the file while it is being played back, the recorder will stop at the index mark. However, the index mark will be jumped over if you try skipping to the beginning of the file while playback is stopped (☞ P. 48).
- If you try skipping to the beginning of a file during playback with [**Skip Space**] set to a selection other than [**File Skip**], the recorder will skip or reverse-skip for the set amount of time before resuming playback (☞ P. 88).

Placing an index mark

An index mark will help you quickly locate a desired playback position when you fast-forward, rewind, or cue a file.

- Be sure to assign the [**INDEX**] function to the **Fn** button in advance (☞ P.106).

1 At the position you wish to place an index mark, press the preassigned **Fn** button.



- A number appears on the display, and the index mark is placed.
- Placing an index mark does not stop recording or playback, so you can continue placing index marks at other positions by the same procedure.

Erasing an index mark

1 Select the file with the index mark you wish to erase.

2 Select the index mark to erase with the ▶▶I/I◀◀ button.

3 Press the **ERASE** button while the index number is being displayed (approx. 2 seconds).

- The index mark will be erased.
- The index numbers after the erased index mark will be automatically adjusted.

Notes

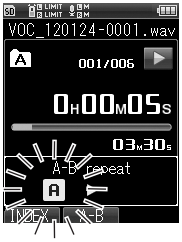
- Each file can contain up to 99 index marks. If you try to place more than 99 index marks, [**No more can be set**] will appear.
- Index marks cannot be added to or erased from a locked file (☞ P. 90).
- Index marks can only be placed in files recorded by this recorder.

Segment repeat playback

This feature allows you to play back a part of a file in repeat.

- Be sure to assign the [**A-B**] function to the **Fn** button in advance (☞ P. 106).

1 Select the file that has the segment you wish to play back in repeat, and start playback (☞ P. 34, P. 45).



2 At the position you wish to start the segment repeat, press the preassigned **Fn** button.

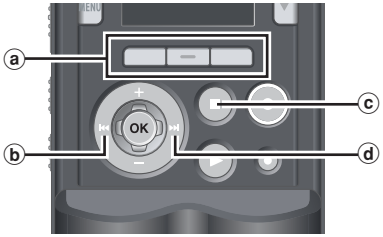
- [A] will flash on the display.
- While this [A] is flashing, you can still fast-forward or rewind just as in normal playback (☞ P. 47), allowing you to quickly locate the end position.

3 At the position you wish to end the segment repeat, press the **Fn** button again.

- The segment will be played back in repeat until you release the segment repeat playback.

Releasing the segment repeat playback

Pressing any of the following buttons will release the segment repeat playback.



ⓐ **Fn** (Cancel) button

Pressing the **Fn** (Cancel) button will release the segment repeat playback and set the recorder back to the normal playback mode.

ⓑ ⏮ button

Pressing the ⏮ button will release the segment repeat playback and the recorder will skip to the beginning of the current file.

ⓒ **STOP** button

Pressing the **STOP** button will release the segment repeat playback, and playback will stop.

ⓓ ⏭ button

Pressing the ⏭ button will release the segment repeat playback and the recorder will skip to the beginning of the next file.

Note

- Adding/erasing an index mark while a segment is being played back in repeat will release the segment repeat playback, and set the recorder back to the normal playback mode.

Erasing a File

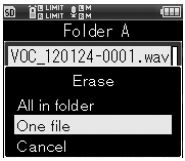
You can erase a file from its folder. You can also erase all files in a selected folder.

1 Select a file to erase (☞ P. 34, P. 45).

2 While the recorder is stopped, press the **ERASE** button.

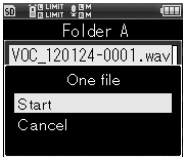
- If no action is taken for 8 seconds, the recorder will return to the stop mode.

3 Select [**All in folder**] or [**One file**] with the **+/−** button.



4 Press the **OK** button.

5 Select [**Start**] with the **+** button.



6 Press the **OK** button.

- The display switches to [**Erasing!**], and erasing starts. [**Erased**] appears when the file is erased.

Partially erasing a file

You can erase an unwanted part of a PCM format file recorded with this recorder.

1 Play the file you wish to partially erase.

- Locate the beginning of the part you wish to erase. If the file is long, you can use the ▶▶| button to locate the beginning of the part to erase.

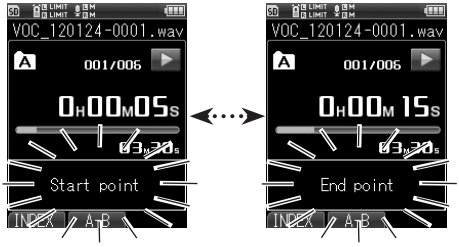
2 At the beginning of the part to erase, press the **ERASE** button.

- [**Erase started**] will flash on the display.

- Playback continues while [**Erase started**] is flashing, and you can still fast-forward or rewind just as in normal playback, allowing you to quickly locate the end position. If the file reaches the end while the message is flashing, the file's end becomes the end position of the partial erase.

3 Press the **ERASE** button again at the position where you wish to end the partial erase.

- [**Start point**] and [**End point**] will flash alternately on the display.



4 Press the **ERASE** button.

- The display switches to [**Partial erasing!**], and partial erasing starts. [**Partial erase completed**] appears when the file is partially erased.
- If you do not press the **ERASE** button within 8 seconds, partial erase will be canceled, and the recorder will return to the playback mode.

Important Notes on Erasing

- Once erased, files cannot be recovered. Check carefully before erasing files.
- When you have an SD card inserted in the recorder, make sure to check if your memory selection is set to [**Internal memory**] or [**SD card**] (☞ P. 107).
- Locked or read-only files cannot be erased (☞ P. 90).
- No more recordings can be made when [**Memory full**] appears. Erase unnecessary files before continuing to record.
- Files that the recorder does not recognize, as well as folders containing such files, will not be erased. To erase them, connect the recorder to your computer.
- Check the remaining battery level beforehand in order to avoid running out of the battery during the process. Note that the erasing process may take a few tens of seconds. Never perform the following operations while erasing is in progress, as doing so may damage your data:
  ① Disconnect the AC adapter.
  ② Remove the battery.
  ③ Remove the SD card while the recording medium is set to [**SD card**].

Chapter 4

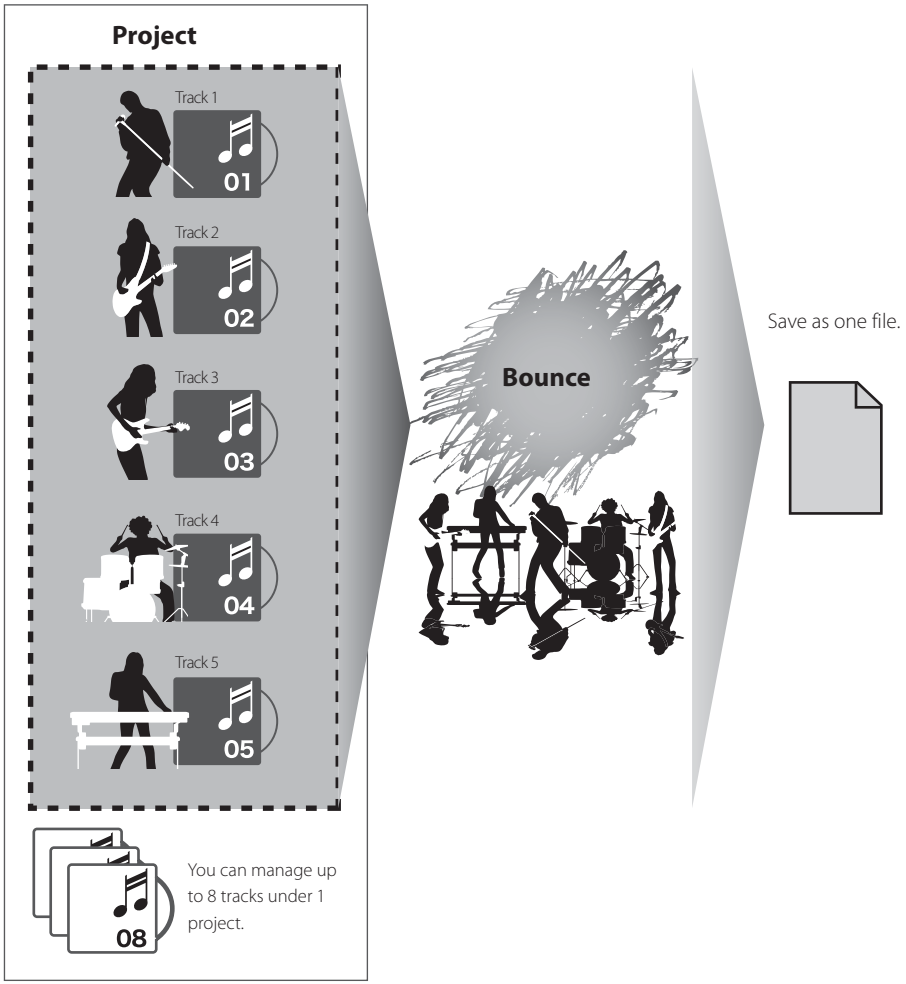
Multi-Track Mode

Multi-Track Mode

The multi-track mode allows you to separately record and play back different parts/sound sources (guitar, bass, drums, keyboard, vocal, etc.).

You can manage up to 8 tracks under 1 project. Recorded tracks can be edited separately to adjust the output level or balance, which is ideal for creating a demo.

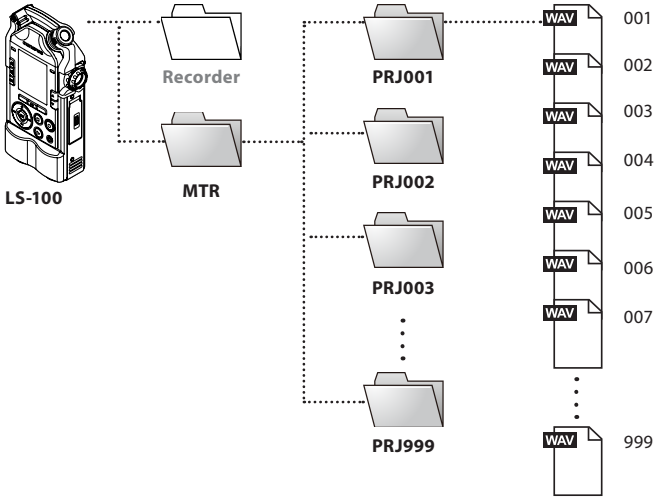
In this mode, you can record over an already recorded track, unlike in the recorder mode. Edited tracks can be mixed (bounced) into a single file.



Files and Folders

Folders

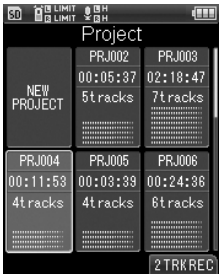
In the multi-track mode, there are folders for managing [**PRJ**] (Project).
Files are managed by the project, and each project has a number assigned.



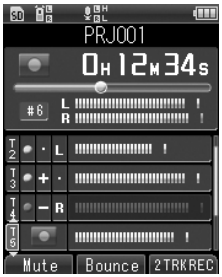
Selecting a project and track

Home screen

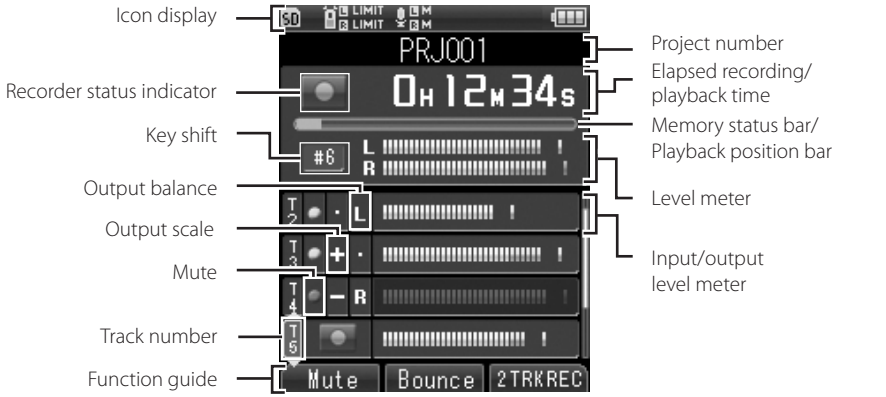
Project screen



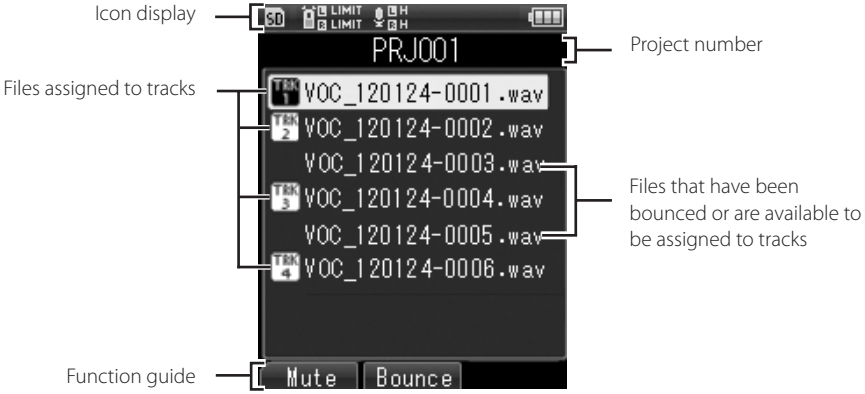
Multi-track screen



Multi-track screen



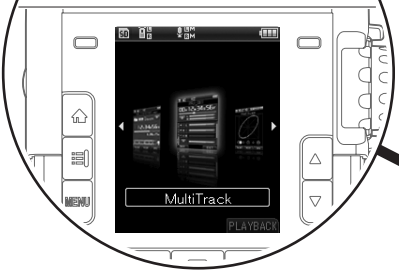
File list screen under a project



Creating a Multi-Track Project

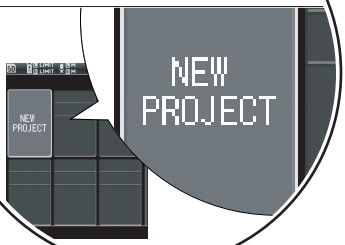
1

Select [**Multitrack**]



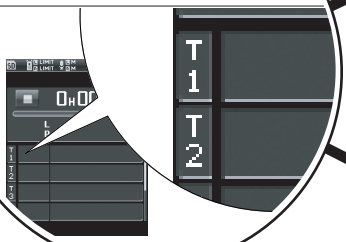
2

Create a project



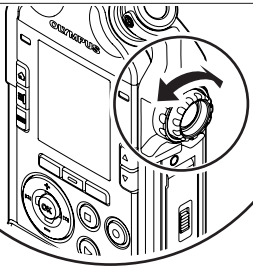
3

Select a track



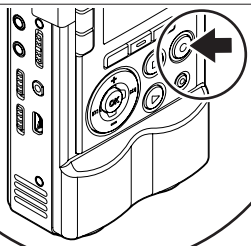
4

Adjust the recording level



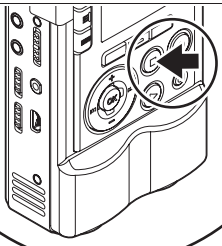
5

Start recording

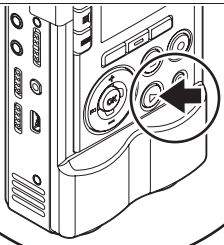


Continued on next page

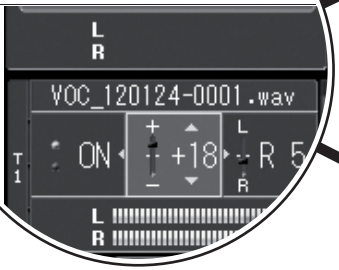
6
Stop recording



7
Check the track (playback)



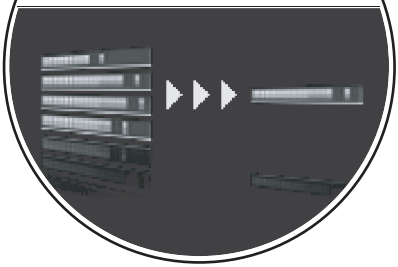
8
Adjust the track



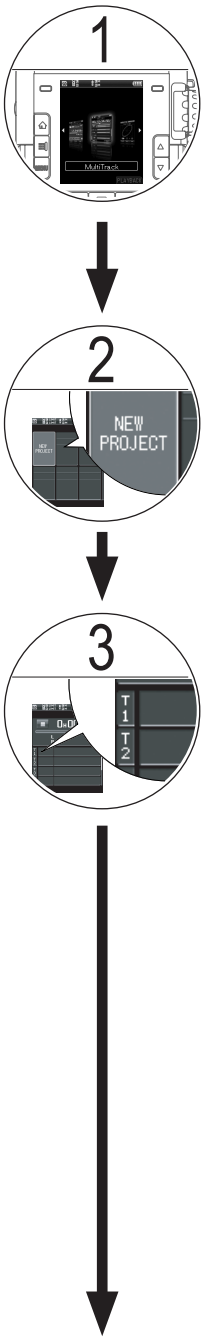
9
Add tracks

Repeat steps 3 to 6 to add more sound sources to empty tracks.

10
Bounce the tracks



See pages 59 to 63 for details.



Select [Multitrack]

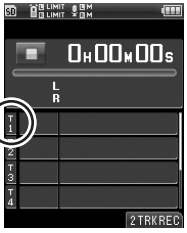
① Select [**Multitrack**], and press the **OK** button.

Create a project

In the Multi-Track mode, recorded files (tracks) are saved under a project.

① Use the **+/-/▶▶I/I◀◀** button to select [**NEW PROJECT**], and press the **OK** button.

Select a track

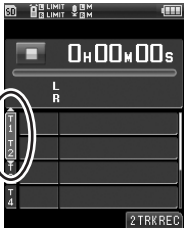


1TRKREC

• You can record up to 8 tracks; recording can be 1-track or 2-track recording.

In 1-track recording, input sound from L/R is recorded as a mixed, monaural signal.

Input source	Input Mode
Built-in Mic	Mono (L/R MIX)
External Mic	
LINE Input	
XLR Input	Mono (L)

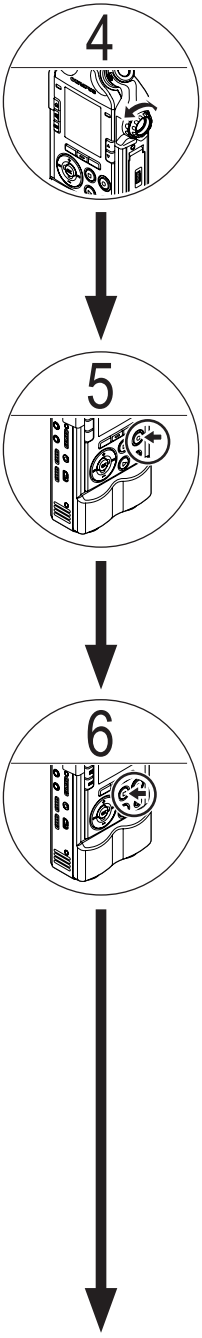


2TRKREC

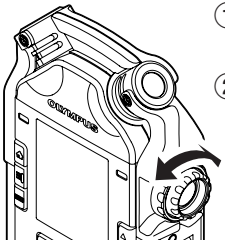
• Press the **F3** (**2TRKREC**) button to record on two tracks simultaneously. Please choose the two tracks between the following four couples: 1+2, 3+4, 5+6, 7+8.

In 2-track recording, the odd number track will be assigned to the L channel, and the even number track will be assigned to the R channel.

Input source	Input Mode
Built-in Mic	L/R Input (Stereo)
External Mic	
LINE Input	
XLR Input	Mono (L) / Mono (R)



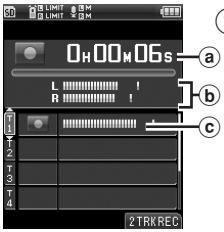
Adjust the recording level



① Press the **REC** button to enter the recording standby mode.

② Adjust the **REC LEVEL** dial according to the sound source (☞ P. 36).

Start recording



① Press the **REC** button.

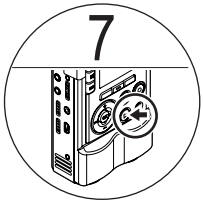
- [●] appears on the display, and recording starts.

ⓐ Elapsed recording time
ⓑ Level meter
ⓒ Input level meter

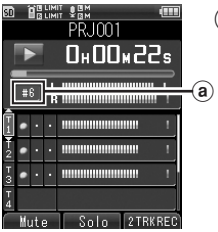
Stop recording

① Press the **STOP** button.

- To re-record, record over the same track. It will not erase the previously recorded file.



Check the track (playback)

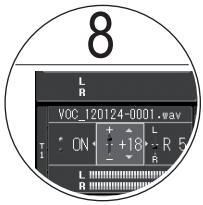


① Press the **PLAY** button.

- The multiple tracks you have recorded under the project will be played back together.
- You can change the pitch by pressing the ▲/▼ button while a track is selected. Pressing the ▲ button will raise the pitch by a semitone (#1–6), while the ▼ button lowers it by a semitone (♭1–6). Set the cursor to the track you wish to playback and press the **Fn** (Key) button; you will be able to adjust the key of the selected track. Be sure to assign the [**Key Change**] function to the **Fn** button in advance. However, you cannot select a track for key adjustment while playback is in progress.

ⓐ Current pitch

- To listen to a specific track while muting the others, set the cursor to the track you wish to play back, and press the **Fn** (Solo) button. Be sure to assign the [**Solo**] function to the **Fn** button in advance (☞ P. 106).
- To rewind the file, press and hold the ⏮ button when the recorder is in playback mode.
- To fast-forward the file, press and hold the ⏭ button when the recorder is in playback mode.

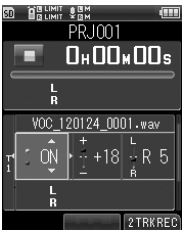


Adjust the track

① Select a track to adjust with the **+**/**−** button.

② Press the ⏭ button to choose the setting you wish to change.

- The edit screen switches each time you press the ⏭ button. To return to the previous screen, press the ⏮ button.

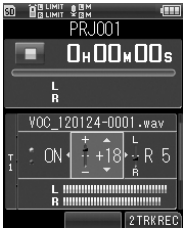


■ **Mute:** Press ⏭ once.

Mute can be set for each track. Change the mute setting with the **+**/**−** button.
The mute function can be assigned to the **Fn** button.

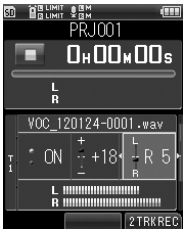
Continued on next page

8



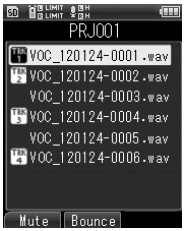
■ **Output balance:** Press ▶▶| twice.

You can adjust the volume for each track. Adjust the volume with the **+**/**−** button.



■ **Left/right balance:** Press ▶▶| three times.

You can adjust the panning of left and right audio for each track. Adjust the left/right balance with the **+**/**−** button.



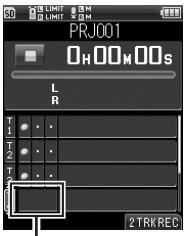
■ **Track assignment:** Press ▶▶| four times.

You can assign files that are managed under a project to specific tracks. Use the **+**/**−** button to select files to assign and target tracks, and press the **OK** button.

9

Repeat steps 3 to 6 to add more sound sources to empty tracks.

Add tracks



You can record additional tracks while playing back a previously recorded track.

① Select an empty track with the **+**/**−** button.

ⓐ Empty track

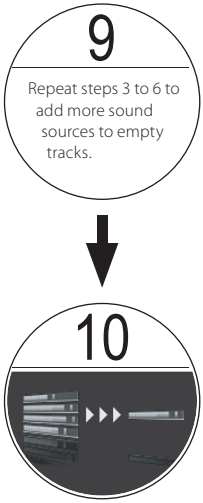
② Press the **REC** button to enter the recording standby mode.

③ Adjust the recording level with the **REC LEVEL** dial.

④ Press the **PLAY** button to play back the previously recorded track.

- All files assigned to the track will be mixed and played back.
- The audio of mixed playback will be output through the **EAR** jack.

Continued on next page



⑤ Press the **REC** button to start recording.

- Listening to the playback, press the **REC** button. The recording will be made on the track specified in step ①.

⑥ Press the **STOP** button to stop recording and playback.

Bounce the tracks

This recorder allows you to save up to 8 tracks under 1 project. Once you run out of empty tracks, create bounce files and assign them to tracks.

You can bounce any of the files that are currently assigned to tracks.

① Press the preassigned **Fn** (Bounce) button.

- The option of bouncing files becomes available once you set the **Track assignment** (☞ P. 62).
- Be sure to assign the [**Bounce**] function to the **Fn** button in advance (☞ P. 106).

② Press the **+** button to select [**Start**].

③ Press the **OK** button.

- An animation will appear on the display, and bouncing starts.
- [**Done**] appears when the bouncing is complete. It will be saved as a new PCM format [**44.1kHz/16bit**] file under the same project.

Erasing a Multi-Track Project/Track

Erasing a project

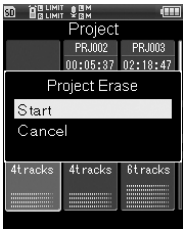
Erase unnecessary projects.

1 Select a project to erase.

2 Press the **ERASE** button.

- The erase confirmation screen appears.

3 Press the **+** button to select [**Start**].



4 Press the **OK** button.

- The display switches to [**Erasing!**], and erasing starts. [**Erased**] appears when the project is erased.

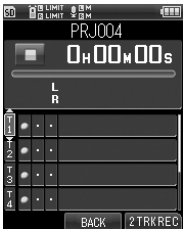
Erase a track

Erase unnecessary tracks.

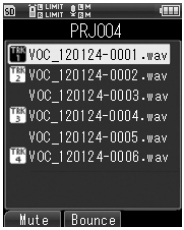
1 Select the project that contains the track you wish to erase.

2 Press the **OK** button.

- The multi-track screen appears.



3 Press the ▶▶| button to go to the final list screen.



4 Select the file to erase with the **+/−** button.

5 Press the **ERASE** button.

- The erase confirmation screen appears.

6 Select [**Start**] with the **+** button.

7 Press the **OK** button.

- The display switches to [**Erasing!**], and erasing starts. [**Erased**] appears when the file is erased.

Important Notes on Erasing

- Once erased, projects or tracks cannot be recovered. Check carefully before erasing them.
- When you have an SD card inserted in the recorder, make sure to check if your memory selection is set to [**Internal memory**] or [**SD card**] (☞ P. 107).

Chapter 5

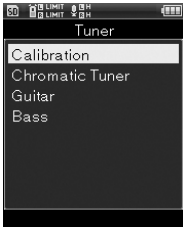
About the Tuner, the Lissajous, and the Metronome

Using the tuner

This recorder is equipped with a tuner function which consists of the following four items: calibration, chromatic, guitar, and bass. This function enables you to perform accurate tuning according to the type of musical instrument you have selected.

1 [**Home**] ➔ [**Tuner**]

2 Press the **+**/**−** button to select type of tuner.



- Select the item to set up from [**Calibration**], [**Chromatic Tuner**], [**Guitar**], and [**Bass**].

3 Press the **OK** button.

- The screen for the item you have selected will appear.

Setting up the [**Calibration**]

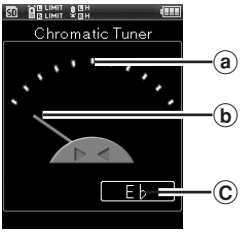
Set up the calibration of the tuner. The frequency of the reference tone A can be adjusted by 1Hz increments in the range of 435Hz to 445Hz.

① Press the **+**/**−** button to select the frequency, and then press the **OK** button

Setting up the [**Chromatic Tuner**]

Supports all the musical scales and allows you to tune the pitch of the instrument inserted to the reference pitch.

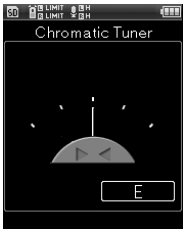
① Tune the musical instrument by playing a single note



ⓐ The target position of the reference tone
ⓑ The tuning meter
Ⓒ The name of the note closest to the entered sound

- The name of the note closest to the recognized sound appears.
- The target of the tuning is the note (signal) that is currently displayed.

② Adjust while looking at the tuning meter and the indicator

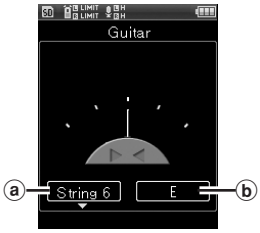


- Tune accurately with the needle pointing to the center of the meter.
- Any electronic musical instrument should be directly connected without any additional equipment (such as an effector).

Setting up the [**Guitar**] and the [**Bass**]

These items are basic tuning types for the guitar and the bass.

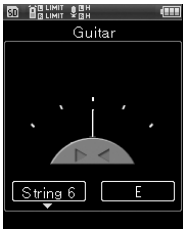
① Tune the musical instrument by plucking a single note



ⓐ The number of the string to tune
ⓑ The tuning chord

- The reference value of the string that has been plucked appears.

② Adjust while looking at the tuning meter and the indicator



- Tune accurately with the needle pointing to the center of the meter.

A guitar chords chart

String number/Note name					
1	**2**	**3**	**4**	**5**	**6**
E	**B**	**G**	**D**	**A**	**E**

A bass chords chart

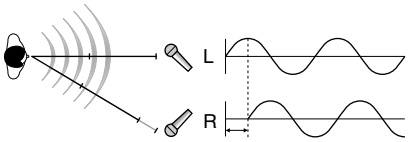
String number/Note name			
1	**2**	**3**	**4**
G	**D**	**A**	**E**

About the Lissajous measurement

In facilities for sound recording (such as broadcasting studios), the distance between a microphone and a sound source is automatically measured from the phase difference. The Lissajous waveform helps you obtain the optimal positioning of a dynamic microphone or a condenser microphone.

What is a phase difference?

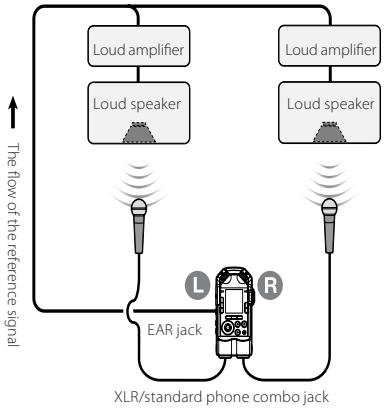
A slight difference between two sound waves is called a phase difference. The sound is equally fed into the left/right sides of the microphone if it is directly in front of the sound source. However, a slight time difference is produced between the left and right channels if the sound source is slightly off either to the left side or right side of the microphone.



Use the lissajous measurement to perform optimal sound recording.

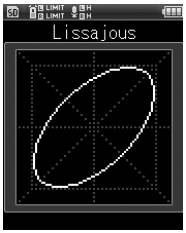
1 Connect an amplifier to the recorder before starting to measure.

When using a dynamic microphone or condenser microphone

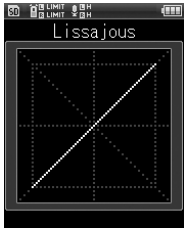


2 [Home] ➔ [Lissajous]

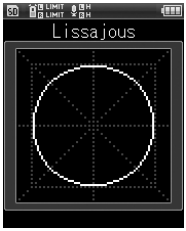
3 The current measurement value appears.



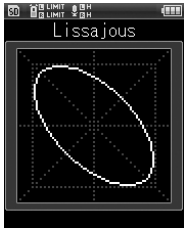
Examples of the measurement display:



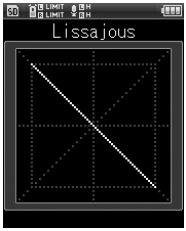
Phase difference 0 degree



Phase difference 90 degrees



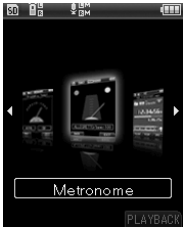
Phase difference 135 degrees



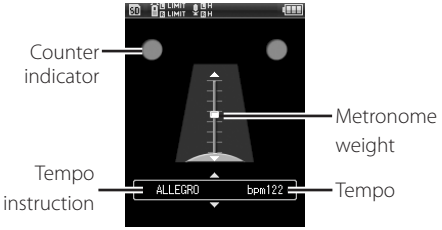
Phase difference 180 degrees

Using the metronome

1 [**Home**] ➔ [**Metronome**]



2 Press the **+**/**−** button to adjust the tempo.



3 Press the **PLAY** button to start the metronome.

- Use the **VOLUME** dial to adjust the volume of the metronome.
- Select the [**Metoronome Menu**] from the [**MENU**] to make additional settings for the metronome (☞ P. 100).

Tempo instructions to provide a rough idea of tempo

LARGO	Widely and slowly	♩ =40~59
LARGHETTO	A little more slowly	♩ =60~65
ADAGIO	Slowly	♩ =66~75
ANDANTE	Walking tempo	♩ =76~107
MODERATO	Moderately	♩ =108~119
ALLEGRO	Rapidly	♩ =120~167
PRESTO	Very fast	♩ =168~200
PRESTISSIMO	Very very fast	♩ =201~208

Chapter 6

Menus

How to set the menus

Items in the menus are classified by the tabs. Therefore, when shifting between items, you can quickly set the target item by selecting the tab to which it belongs. Take the following steps to set each item in the menu.

1 Press the **MENU** button.

• The menu screen opens.

2 Press the ▶▶I/I◀◀ button to select the tab which contains the target item to be set.

• When the cursor in the setting tab is moved, the menu screen changes.

3 Press the +/− button to select the item to be set.

4 Press the **OK** button.

• The screen shifts to the menu of the selected item.

5 Press the **+**/**−** button to select a menu item.

6 Press the **OK** button to finish the setting.

- The screen shows that the setting is finalized.
- If you press the ⏮ button without pressing the **OK** button, the setting operation is cancelled, and the screen returns to the previous screen.

7 Press the **MENU** button to close the menu screen.

- When the menu screen is opened during recording or playing status, pressing the **MENU** button returns the screen to the previous screen.

List of menus

in the choices field indicates the default setting.

Recording Menu [Rec Menu]: Menu settings for recording

Set items	Choices	Operation mode ○: Setting OK ×: Setting NG		
		Stopped	Playing	Recording
Recording mode* [Rec Mode] ☞ P. 79	[**Normal**] [**Overdub**] [**Play Sync**] [**V-Sync. Rec**]	○	○	×
Mic gain [Mic Gain] ☞ P. 80	[**Built-in Mic**]: [HI] [MID] [LO] [**External Mic**]: [HI] [MID] [LO] [**XLR(L)**]: [HI] [LO] [**XLR(R)**]: [HI] [LO]	○	○	○
Recording level [Rec Level] ☞ P. 81	[**Manual**] You can adjust the limiter/compressor settings for each input source. [**Auto**]	○	○	○
Input selection [Input Select] ☞ P. 82	[**Built-in Mic**] [**External Mic**] [**Line**] [**XLR/Phone**]	○	○	×
Mic power [Mic Power] ☞ P. 83	[**Phantom Power**]: [**48V**] [**24V**] [**Plug-in Power**]: [**On**] [**Off**]	○	○	○
Recording format [Rec Format] ☞ P. 84	[**PCM**]: [**44.1kHz/16bit**] [**MP3**]: [**128kbps**]	○	○	×
Low cut filter [Low Cut Filter] ☞ P. 85	[**300Hz**] [**100Hz**] [**Off**]	○	○	○
Pre-recording* [Pre-Recording] ☞ P. 86	[**On**] [**Off**]	○	○	×
Recording monitor [Rec Monitor] ☞ P. 87	[**On**] [**Off**]	○	○	○

* In the Multi track mode, [**Rec Mode**] and [**Pre-Recording**] do not function.

Play Menu [Play Menu]: Menu settings for playback

Set items	Choices	Operation mode ○: Setting OK ×: Setting NG		
		Stopped	Playing	Recording
Play mode [Play Mode] ☞ P. 88	[**One file**] [**List**]	○	×	○
Skip space* [Skip Space] ☞ P. 88	[**Forward Skip**]: [**File Skip**][10sec.][30sec.] [1min.][5min.][10min.] [**Reverse Skip**]: [**File Skip**][1sec.][3sec.][5sec.] [10sec.][30sec.][1min.][5min.]	○	○	○

* In the Multi track mode, [**Skip Space**] do not function.

File menu [File Menu]: Menu settings that relate to files

Set items	Choices	Operation mode ○: Setting OK ×: Setting NG		
		Stopped	Playing	Recording
Erase Lock [File Lock] ☞ P. 90	[**On**] [**Off**]	○	×	×
File Move/Copy [Move/Copy] ☞ P. 91	Copies and moves the files within the memory.	○	×	×
File Divide* [File Divide] ☞ P. 94	Divides a file recorded on this device.	○	×	×
Property [Property] ☞ P. 95	Displays information about a file or folder.	○	○	×

MP3 Convert [MP3Convert] ☞ P. 95	Converts a PCM [**44.1 kHz/16 bit**] (WAV) format file into an MP3 format file.	○	×	×
CD Write [CD Write] ☞ P. 97	Directly writes a PCM [**44.1 kHz/16 bit**] (WAV) format file into a CD.	○	×	×
Bounce** [Bounce] ☞ P. 98	Saves all the tracks in a multi-track mode project to one file.	○	×	×

***** In the Multi track mode, [**File Divide**] does not function.
****** In the recorder mode, [**Bounce**] does not function.

Metronome Menu [Metronome Menu]: Menu settings that relate to the metronome

Set items	Choices	Operation mode ○: Setting OK × : Setting NG		
		Stopped	Playing	Recording
Metronome [Metronome] ☞ P. 100	[**Off**] [**On**] [**Setting**]: You can set [Display], [Countdown], [Tempo], [Sound], [Pattern], and [Volume].	○	○	×

LCD/Sound Menu [LCD/Sound Menu]: Menu settings that relate to the LCD and sound

Set items	Choices	Operation mode ○: Setting OK ×: Setting NG		
		Stopped	Playing	Recording
Backlight [Backlight] ☞ P. 102	[**Lighting time**]: [5sec.] [**10sec.**] [30sec.] [1min.] [Always on] [**Dim light time**]: [**30sec.**] [1min.] [2min.] [5min.] [Always on] [**Brightness**]: [1] [2] [3]	○	○	○
LED [LED] ☞ P. 103	[**On**] [**Off**]	○	○	○
Beep [Beep] ☞ P. 103	[**00**] [**01**] [**02**] [**03**] [**04**] [**05**]	○	○	○
Language selection [Language (Lang)] ☞ P. 104	The languages available for display vary depending on the sales region.	○	○	○
Voice guide [Voice Guide] ☞ P. 104	[**On/Off**]: [**On**] [**Off**] [**Speed**]: [100%]–[400%] The default is [**100%**] [**Volume**]: [01] [02] [**03**] [04] [05]	○	○	○
Intro play [Intro Play] ☞ P. 105	[**10sec.**] [**5sec.**] [**3sec.**] [**Off**]	○	○	○

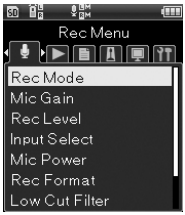
Device Menu [Device Menu]: Menu settings that relate to the device

Set items	Choices	Operation mode ○: Setting OK ×: Setting NG		
		Stopped	Playing	Recording
Fn key setting [Fn. Setting] ☞ P. 106	[**Fn. Recorder**]: [F1] [F2] [F3] [**Fn. MTR**]: [F1] [F2] [F3] The functions can be assigned from each template.	○	○	○
Memory selection [Memory Select] ☞ P. 107	[**Internal memory**] [**SD card**]	○	×	×
Power save [Power Save] ☞ P. 108	[**5min.**] [**10min.**] [**30min.**] [**1hr.**] [**Off**]	○	○	○
Clock setting [Time & Date] ☞ P. 108	[**Hour**] [**Minute**] [**Year**] [**Month**] [**Day**]	○	○	×
USB setting [USB Settings] ☞ P. 109	[USB Connection]: [**PC**] [AC Adapter] [Optional] [USB Class]: [**Storage Class**] [Composite]	○	○	○
Setting reset [Reset Settings] ☞ P. 111	Resets the settings to the default.	○	×	×
Formatting [Format] ☞ P. 113	Formats the selected memory.	○	×	×
Memory info [Memory Info.] ☞ P. 115	Displays the remaining memory and capacity.	○	○	○
System info [System Info.] ☞ P. 115	[**Model**] [**Version**] [**Serial No.**]	○	○	○

Recording mode [Rec Mode]

This menu sets the recording method of the recorder mode.

1 [**Menu**] ➔ [**Rec Menu**] ➔ [**Rec Mode**]



2 Press the **OK** button.

3 Press the **+/−** button to select the recording method.

[**Normal**]

This method records sound in the standard way (☞ P. 37).

[**Overdub**]

While a file is playing, the input sound can be recorded over the current file (☞ P. 39).

[**Play Sync**]

Only the audio source that was recorded in synchronizaton with the file content is saved (☞ P. 41).

[**V-Sync. Rec**]

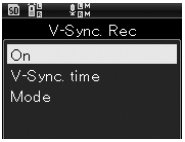
This method automatically starts recording when a sound that is louder than the set audio synchro level is detected (☞ P. 43).

4 Press the **OK** button.

- When [**V-Sync. Rec**] is selected, the Menu screen opens.

When [**V-Sync. Rec**] is selected

① Select a menu item by pressing the **+/−** button and then the **OK** button.



[**On**] setting

① Press the **OK** button.

- V-synchro recording functions.
- When [**Rec Mode**] is changed to a different mode, the function turns off automatically.

[**Silent detect time**] setting

① Select the detect time by pressing the **+/−** button and then the **OK** button.

- This setting sets the detecting time. When the input (recording level) remains lower than the specified setting for longer than the set detecting time, the recorder shifts into the wait status or the stop status.

[**Mode**] setting

① By pressing the **+/−** button, select either [**One time**] or [**Continuous**] and then press the **OK** button.

[**One time**]

After completion of recording, the file closes, and the device shifts into the recording stop status.

[**Continuous**]

After completion of recording, the file closes and the device shifts into the recording wait status. When any sound is detected, the sound is recorded in a new file.

Microphone gain [Mic Gain]

Sensitivity to the input source can be changed in accordance with the application and/or the recording environment.

1 [**Menu**] ➔ [**Rec Menu**] ➔ [**Mic Gain**]

2 Press the **OK** button.

3 Press the **+/−** button to select the Input source.

[**Built-in Mic**]

This setting adjusts the sensitivity of the built-in stereo microphone.

[**External Mic**]

This setting adjusts the sensitivity of the externally connected microphone.

[**XLR (L)**]

This setting adjusts the sensitivity of the XLR type microphone that is connected to the L channel.

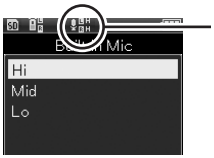
[**XLR (R)**]

This setting adjusts the sensitivity of the XLR type microphone that is connected to the R channel.

4 Press the **OK** button.

- The sensitivity setting for the selected input source appears.

5 Press the **+/−** button to select the sensitivity.



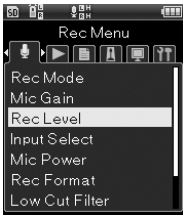
- For [**Built-in Mic**] and [**External Mic**], you can select from [**Hi**], [**Mid**], and [**Lo**], and for [**XLR (L)**] and [**XLR (R)**], you can select from [**Hi**] and [**Lo**].

6 Press the **OK** button to finish the setting.

Recording level [Rec Level]

This setting can set either automatic or manual adjustment of the recording level. In addition, with the limiter/compressor of the input source , it can adjust the audio range for limiting.

1 [**Menu**] ➔ [**Rec Menu**] ➔ [**Rec Level**]



2 Press the **OK** button.

3 Press the **+/−** button to select the input microphone.

4 Press the **OK** button.

- The setting for the selected input source appears.

5 Press the **+/−** button to select a menu item.

[**Manual**]

The recording level is to be adjusted manually at recording. Limiter/compressor can be set.

[**Auto**]

The recording level is adjusted automatically at recording. This setting is convenient when you want to start recording quickly.

6 Press the **OK** button.

- When [**Manual**] is selected, the limiter/compressor setting screen opens.

When [**Manual**] is selected

① Select a menu item by pressing the **+/−** button and then the **OK** button.

[**Limiter 1**]

[**Compressor 1**]

Select this setting to enhance the sound strength. The recorded sound will have a richer release but a poorer attack. This setting is suitable for music recordings.

[**Limiter 2**]

[**Compressor 2**]

Select this setting to equalize the sound strength. The sound can be recorded at a predetermined set volume to produce equalized recordings. The recorded sound will have a richer attack but a poorer release. This setting is suitable for voice recordings.

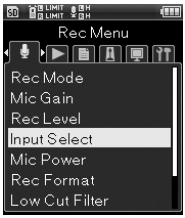
[**Limit/Comp Off**]

This setting is used when adjusting the input level without using the correction function.

Input switch [Input Select]

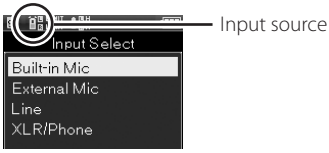
This setting sets the input channel of the audio source.

1 [**Menu**] ➔ [**Rec Menu**] ➔ [**Input Select**]



2 Press the **OK** button.

3 Press the **+/−** button to select the Input source.



[**Built-in Mic**]

Sound is input through the built-in stereo microphone.

[**External Mic**]

Sound is input by connecting an external microphone to the **MIC** jack.

[**Line**]

Sound is input by connecting an external unit to the **MIC** jack.

[**XLR/Phone**]

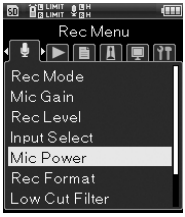
Sound is input through a musical instrument or the microphone connected to the XLR/standard phone combo jack.

4 Press the **OK** button to finish the setting.

Microphone power source [Mic Power]

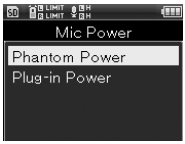
This setting sets the voltage used when a microphone or an external unit which needs the phantom power supply is connected. It also sets whether the power is supplied to the external microphone corresponding to the plug-in power function.

1 [**Menu**] ➔ [**Rec Menu**] ➔ [**Mic Power**]



2 Press the **OK** button.

3 Press the **+**/**−** button to select a menu item.



[**Phantom Power**]

This setting sets the voltage of the phantom power.

[**Plug-in Power**]

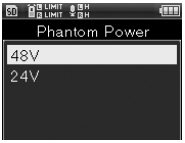
This setting sets the power supply of the plug-in power.

4 Press the **OK** button.

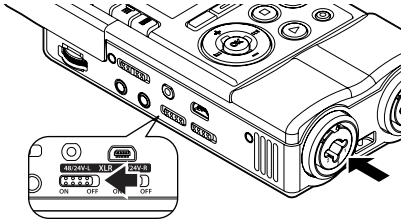
• The selected menu screen appears.

When [**Phantom Power**] is selected

① Select the voltage by pressing the **+**/**−** button and then the **OK** button.



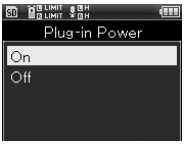
② To enable the setting, turn [**ON**] the **XLR Power** switch on the recorder.



• Even if the microphone is not connected, the remaining battery time will be reduced faster if the **XLR power** switch is turned [**ON**], so please be careful.

When [**Plug-in Power**] is selected

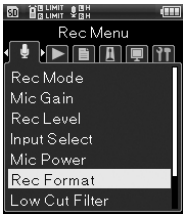
① By pressing the **+**/**−** button, select either [**On**] or [**Off**] and then press the **OK** button.



Recording format [Rec Format]

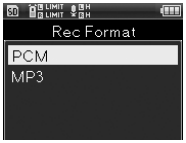
This setting corresponds to the linear PCM format that can record sound at a sound quality that is better than CDs and to the MP3 format that can record by highly compressing the file.

1 [**Menu**] ➔ [**Rec Menu**] ➔ [**Rec Format**]



2 Press the **OK** button.

3 Press the **+/−** button to select the recording format.



[**PCM**]

This is the uncompressed phonological form that is used for music CDs.

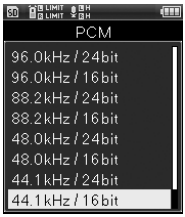
[**MP3**]

This is the International Standard that MPEG, the working group of ISO (International Organization for Standardization), has established.

4 Press the **OK** button.

• The selected menu screen appears.

5 Press the **+/−** button to select the recording rate.



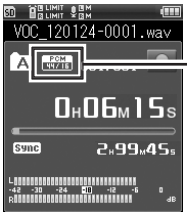
[**PCM**]

[**96.0kHz/24bit**] to [**44.1kHz/mono**]
Files saved in the PCM (WAV) format correspond to BWF (Broadcast Wave Format), and the date and time that each file is recorded is added to the file.

[**MP3**]

[**320kbps**] to [**64kbps (mono)**]

6 Press the **OK** button to finish the setting.



Note

• Corresponding formats for [**MP3 Convert**] (☞ P. 95) and [**CD Write**] (☞ P.97) functions are the PCM format with [**44.1kHz/16bit**]. No other formats correspond.

Low cut filter [Low Cut Filter]

The recorder has a low-cut filter function that eliminates low frequency sound during recording for recording of clearer sound. It can diminish air conditioning noise and the noise of the projector.

1 [**Menu**] ➔ [**Rec Menu**] ➔ [**Low Cut Filter**]

2 Press the **OK** button.

3 Press the **+**/**−** button to select a menu item.

[**300Hz**]

[Use this setting when the [**100Hz**] setting is not sufficiently effective.

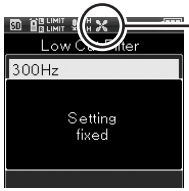
[**100Hz**]

This function diminishes the noise generated by air conditions, projectors, and so on. It is effective when recording indoors.

[**Off**]

This setting stops the function.

4 Press the **OK** button to finish the setting.



Pre-recording [Pre-Recording]

The pre-recording function starts recording a maximum of two seconds* prior to the start of recording. For example, if you want to record the sound of a bird singing and you press the **REC** button when the bird sings, recording starts a maximum of two seconds* prior to the bird singing.

1 [**Menu**] ➔ [**Rec Menu**] ➔ [**Pre-Recording**]

2 Press the **OK** button.

3 Press the **+/−** button to select a menu item.

[**On**]

Recording starts a maximum of two seconds* prior to the start of recording.

[**Off**]

This setting stops the function.

4 Press the **OK** button to finish the setting.

How to use Pre-Recording

To record sound using Pre-Recording, set [**Pre-Recording**] to [**On**].

1 Press the **REC** button during recording.

- The recorder shifts into the record wait status. It constantly records a maximum of two seconds* of sound.

2 Press the **REC** button.

- The recorder resumes recording. It starts recording from a maximum of two seconds * prior to the resumption of recording.

* The length depends on the [**Rec Format**] setting.

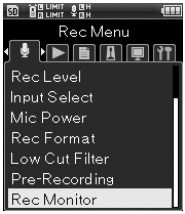
Notes

- When the [**Pre-Recording**] function is used, the following functions cannot be used.
  - [**V-Sync. Rec**] (☞ P. 43)
  - [**Metronome**] (☞ P. 100)

Recording monitor [Rec Monitor]

This setting selects whether the recording sound is output from the **EAR** jack.

1 [**Menu**] ➔ [**Rec Menu**] ➔ [**Rec Monitor**]



2 Press the **OK** button.

3 Press the **+**/**−** button to select a menu item.

[**On**]

The recording monitor functions.

[**Off**]

This setting stops the function. No sound is output from the **EAR** jack.

4 Press the **OK** button to finish the setting.

Notes

- When [**Rec mode**] is set to [**Overdub**] or [**Play Sync**], set [**Rec Monitor**] to [**ON**].
- When a speaker with built-in amplifier or other device is connected, microphone feedback could occur during recording.For the recording monitor, use the head phone, or set [**Rec Monitor**] to [**Off**] during recording.

Play menu [Play Menu]

Play mode [Play Mode]

This setting enables you to select your preferred play mode.

1 [**Menu**] ➔ [**Play Menu**] ➔ [**Play Mode**]

2 Press the **OK** button.

3 Press the **+**/**−** button to select a menu item.

[**One file**]

Playback stops right after the current file is played.

[**List**]

This setting plays the files in a folder.

4 Press the **OK** button to finish the setting.

Skip space [Skip Space]

This function skips (forwards) or reverse skips (reverses) by the set time while playing a file. It is convenient for moving quickly to the playing position or for playing short phrases repeatedly.

1 [**Menu**] ➔ [**Play Menu**] ➔ [**Skip Space**]

2 Press the **OK** button.

3 Press the **+**/**−** button to select a menu item.

[**Forward Skip**]

Playback starts after the set time is skipped.

[**Reverse Skip**]

Playback starts after the set time is reverse skipped.

4 Press the **OK** button.

• The selected menu screen appears.

5 Press the **+/−** button to select a menu item.

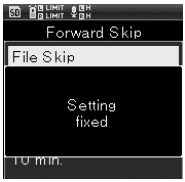
[**Forward Skip**]

[File skip] [10 sec.] [30 sec.] [1 min.] [5 min.] [10 min.]

[**Reverse Skip**]

[File skip] [1 sec.] [3 sec.] [5 sec.] [10 sec.] [30 sec.] [1 min.] [5 min.]

6 Press the **OK** button to finish the setting.



How to play with skipping and reverse skipping

1 Press the **PLAY** button to start playing.

2 Press ▶▶I/I◀◀ button during playback.

- The set space is skipped or reverse skipped and then playback starts.

Note

- If there is an index mark nearer than the skip position, the recorder skips or reverse-skips to that position.

Erase lock [File Lock]

Setting the erase lock for a file prevents erroneous deletion of important files. In addition, it prevents a file from being deleted even when you conduct a file erase (☞ P. 50).

1 Select a file to set the erase lock (☞ P. 34, P. 45).

2 In stop mode, open the menu.

3 [**Menu**] ➔ [**File Menu**] ➔ [**File Lock**].

4 Press the **OK** button.

5 Press the **+/−** button to select a menu item.

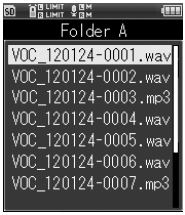
[**On**]
This setting locks the file.
[**Off**]
This setting releases the file lock.

6 Press the **OK** button to finish the setting.

File Move/Copy [Move/Copy]

This setting can move or copy a file saved in the built-in memory or the SD card within the memory. In addition, it can also move/copy a file between memories.

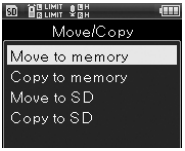
1 Select the folder where the file to be moved or copied is stored (☞ P. 34).



2 [**Menu**] ➔ [**File Menu**] ➔ [**Move/Copy**]

3 Press the **OK** button.

4 Press the **+**/**−** button to select a menu item.



[**Move to memory**]
This menu item moves the files in the built-in memory or the SD card into a different folder in the built-in memory.

[**Copy to memory**]
This menu item copies the files in the built-in memory or the SD card into a different folder in the built-in memory.

[**Move to SD**]
This menu item moves the files in the built-in memory or the SD card into a different folder in the SD card.

[**Copy to SD**]
This menu item copies the files in the built-in memory or the SD card into a different folder in the SD card.

5 Press the **OK** button.

- The screen for selecting the number of files to be moved or copied opens.

6 Press the +/− button to select the number of files for moving or copying.

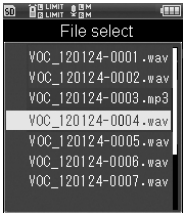
[**One file**]
The specified file is selected.
[**Selected files**]
Several files are selected.
[**All files**]
All files in the folder are selected.

7 Press the **OK** button.

• The selected menu screen appears.

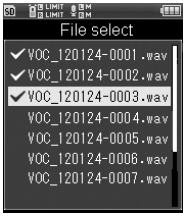
[**One file**] setting

① Press the **+**/**−** button to select the file to be moved or copied and press the **OK** button.



[**Selected files**] setting

① Press the **+**/**−** button to select the file to be moved or copied and press the **OK** button to put a check mark in the file.



② Repeat step 1, select a file to be moved or copied, and then press the **F2** (OK) button.

[**All files**] setting

① All files in the current folder are automatically selected, and the screen shifts to the [**Destination**] screen.

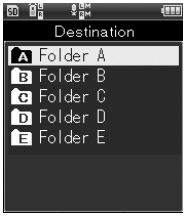
8 Press the +/− button to select a destination folder for files to be moved or copied.

• [**Multitrack**] will not be displayed if a file format different from PCM format [**44,1 kHz/16bit**] has been selected.

9 Press the **OK** button.

Moving/copying to [**Recorder**]

① Press the **+**/**−** button to select a folder to be moved or copied.



Moving/copying to [**Multitrack**]

① Press the **+**/**−** button to select a project to be moved or copied.

10 Press **F2** (OK) button.

- [**Moving!**] or [**Copying!**] appears on the display, and moving or copying of the file starts.
- When [**File move completed**] or [**File copy completed**] is displayed, the process is completed.

Notes

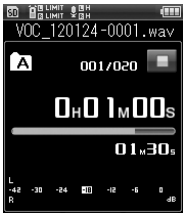
- When the remaining space in the memory is insufficient, the copying process is unavailable.
- When the total number of files exceeds 999, the moving or copying process is unavailable.
- Do not remove the batteries during the file moving or copying process. The data may get damaged.
- A file cannot be moved or copied in the same folder.
- When the moving or copying process is cancelled partway through the process, the process is completed for all files that have already been moved or copied. For all other files, the process is cancelled.
- All files for which File Lock (☞ P. 90) is set continue to be protected by File Lock after the moving or copying process.
- The moving or copying process cannot be used for files located directly under the [**Recorder**] folder.

File divide [File Divide]

When a file with a large capacity or a file that has a long recording time is divided, the File divide function makes it easier to manage and edit the file.

- Only the MP3 and PCM format files recorded with this recorder can be divided.

1 Stop at the position where the file should be divided.



- When the ▶▶I/I◀◀ button is kept pressed, the recorder fast-forwards or fast-reverses.
- It is convenient if the dividing positions are marked with an index mark in advance.

2 [**Menu**] ➔ [**File Menu**] ➔ [**File divide**]

3 Press the **OK** button.

4 Press the **+** button to select [**Start**].

5 Press the **OK** button.

- The display shifts to [**Dividing!**], and file division starts. When [**File divide completed**] is displayed, file division is finished.

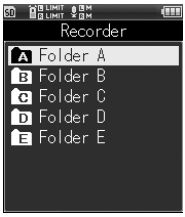
Notes

- [**File divide**] is available only from the file display screen.
- When the number of files in the folder exceeds 999, the dividing process is unavailable.
- Files with the File Lock (☞ P. 90) cannot be divided.
- After the dividing process, the front section is called "**File name_1.wav**", and the rear section is called "**File name_2.wav**."
- Even MP3 or PCM files with a very short recording time may not be able to be divided.
- Do not remove the batteries during the file-dividing process. The data may be destroyed.

Property [Property]

This function enables you to check information about a file or folder.

1 Select the file or folder for which you want to display information (☞ P. 34, P. 45).

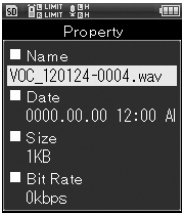


Folder Select

File Select

2 [**Menu**] ➔ [**File Menu**] ➔ [**Property**]

Folder Select



File Select

3 Press the **OK** button.

- If a file is selected, [**Name**], [**Date**], [**Size**], and [**Bit Rate**] are displayed. If a folder is selected, [**Name**] and [**File**] are displayed.

4 After checking the information, press the **OK** button.

MP3 Convert [MP3 Convert]

This function converts an already-saved PCM format WAV file into a bit rate 128 kbps MP3 file. A large-sized WAV file can be downsized.

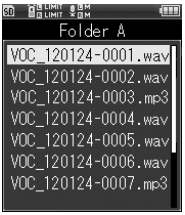
Note

- Files that can be converted are PCM format [**44.1kHz/16bit**] files only.

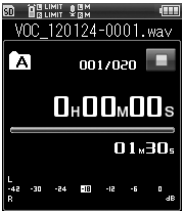
1 Select a WAV file to be converted (☞ P. 34, P. 45).

In the recorder mode:

① Press the **+/−** button to select the file from the file list screen.



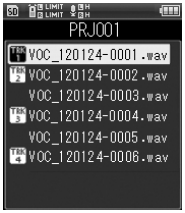
② Press the **►►I** button to switch to the file screen



- It will set the recorder in the stop mode without playing back the file.

In the multi-track mode:

① Press the +/– button to select the file from the file list screen.

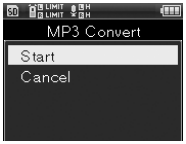


2 [Menu] ➔ [File Menu] ➔ [MP3 Convert]

3 Press the **OK** button.

- The convert check screen appears.

4 Press the **+** button to select [**Start**].



5 Press the **OK** button.

- The animation is displayed on the screen, and MP3 conversion starts. When [**Done**] is displayed, conversion is finished.
- The converted file becomes the [**MP3 128kbps**] format.
- MP3 Converted files cannot be played in multi-track mode. To listen to them, copy them to the recorder folder.

- When [**MP3 Convert**] (☞ P. 106) is set to the **Fn** button, pressing the allocated button starts the conversion.

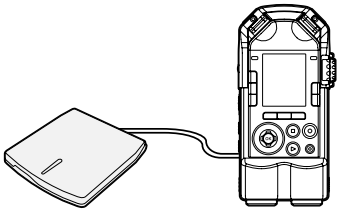
CD write [CD Write]

PCM (WAV) files recorded with this recorder can be directly written to an external CD drive.

Note

- Files that can be written to a CD are PCM format [**44.1kHz/16bit**] files only.

1 Connect the recorder and the external CD drive by using the USB connection cable.

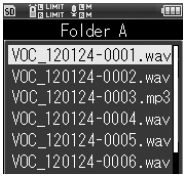


- Insert an empty CD to the CD drive.

2 Select a WAV file to be written to the CD (P. 34, P. 45).

In the recorder mode:

① Press the **+**/**−** button to select the file from the file list screen.



② Press the ▶▶I button to switch to the file screen

- It will set the recorder in the stop mode without playing back the file.

In the multi-track mode:

① Press the +/− button to select the file from the file list screen.

3 [**Menu**] ➔ [**File Menu**] ➔ [**CD Write**]

4 Press the **OK** button.

5 Press the **+**/**−** button to select how many files to write to the CD.

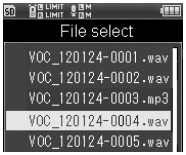
[**One file**]
A single file will be written to the CD.
[**Selected files**]
Multiple files will be written to the CD.

6 Press the **OK** button

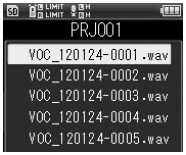
- The screen for your selection will appear.

Setting [**1File**]

① Select the file with the +/– button and press the **OK** button.



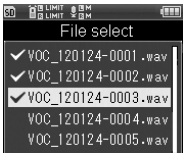
Recorder mode



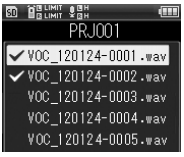
Multi-track mode

Setting [**Selected Files**]

① Select a file with the +/– button and press the **OK** button to mark the file.



Recorder mode



Multi-track mode

② Repeat step 1 to select other files, and press the **F2** (OK) button.

7 Press the **+** button to select [**Start**].

8 Press the **OK** button.

• The animation is displayed on the screen, and CD Write starts. When [**Done**] is displayed, CD Write is finished.

• When [**CD Write**] (☞ P. 106) is set to the **Fn** button, pressing the allocated button starts the CD write.

Notes

• To make the writing more reliable, use the AC power supply to power the external CD drive.

• A few minutes may pass before the process completes. Avoid conducting the following operations in order to prevent damage to data. In addition, check the remaining battery level beforehand in order to avoid running out of the battery during the process.

① Disconnecting the USB cable during the process.
② Removing the battery during the process.
③ When the recording medium is [**SD card**], removing the SD card during processing.
④ Turning off the external CD drive during processing.
⑤ Removing the CD during processing.

Bounce [Bounce]

Multiple tracks saved in a multi-track mode project can be grouped into a single stereo track.

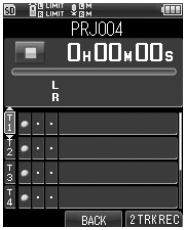
1 [**Home**] ➔ [**Multitrack**]

2 Press the **OK** button.

3 Press the **+**/**-**/**▶▶I**/**I◀◀** button to select the project for the bounce process.

4 Press the **OK** button.

• The screen shifts to the multi track screen.

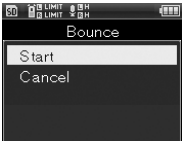


5 [**Menu**] ➔ [**File Menu**] ➔ [**Bounce**]

6 Press the **OK** button.

• The bounce check window appears.

7 Press the **+** button to select [**Start**].



8 Press the **OK** button.

• The animation is displayed on the screen, and the bounce process starts. When [**Done**] is displayed, bouncing is finished.

• When the bounce process completes, the new PCM format [**44.1kHz/16bit**] file is saved in the project.

• When [**Bounce**] (☞ P. 106) is set to the **Fn** button, pressing the allocated button starts the bounce process.

Note

• [**Bounce**] does not function in the recorder mode.

Metronome menu [Metronome Menu]

Metronome [Metronome]

Use this function as a guide when recording an instrument playing or when practicing a musical instrument.

1 [**Menu**] ➔ [**Metronome Menu**]

2 Press the **OK** button.

3 Press the **+**/**−** button to select a menu item.

[**Off**]

The metronome does not function.

[**On**]

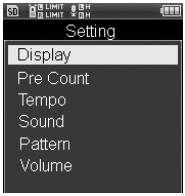
The metronome functions in accordance with the setting in [**Setting**].

[**Setting**]

You can set [**Display**], [**Countdown**], [**Tempo**], [**Sound**], [**Pattern**], or [**Volume**].

4 Press the **OK** button.

- When [**Setting**] is selected, the Menu screen opens.



[**Display**] setting

This setting sets whether the metronome is displayed on the window or not.

① Select a menu item by pressing the **+**/**−** button and then the **OK** button.

[**Countdown**] setting

The number of counts before recording starts can be adjusted between [**00**] and [**10**].

① Press the **+**/**−** button to select the number of counts and then press the **OK** button.

Metronome menu [Metronome Menu]

[**Tempo**] setting

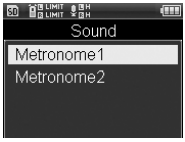
The metronome speed can be adjusted between [**40**] and [**208**].

① Press the **+**/**−** button to select the speed and then press the **OK** button.

[**Sound**] setting

The setting sets the metronome tone.

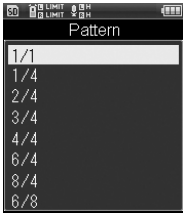
① Select a menu item by pressing the **+**/**−** button and then the **OK** button.



[**Pattern**] setting

The metronome pattern can be selected from [**1/1**] through [**8/4**] as well as [**6/8**].

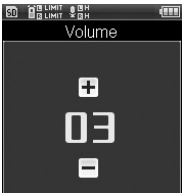
① Select a menu item by pressing the **+**/**−** button and then the **OK** button.



[**Volume**] setting

The metronome volume can be adjusted between [**01**] and [**10**].

① Select the volume by pressing the **+**/**−** button and then the **OK** button.



Backlight [Backlight]

Every time a button is pressed, the display backlight turns on for approximately 10 seconds (default).

1 [**Menu**] ➔ [**LCD/Sound Menu**] ➔ [**Backlight**]

2 Press the **OK** button.

3 Press the **+**/**−** button to select a menu item.

[**Lighting time**]

This setting sets the lighting time of the backlight.

[**Dim light time**]

When the lighting time of the backlight elapses, the backlight changes to the dim light. This setting sets the time of the dim light.

[**Brightness**]

This setting can adjust the backlight brightness in three levels.

4 Press the **OK** button.

• The selected menu screen appears.

5 Press the **+**/**−** button to select a menu item.

6 Press the **OK** button to finish the setting.

LED [LED]

This function can be set so that the LED lamp does not turn on.

1 [**Menu**] ➔ [**LCD/Sound Menu**] ➔ [**LED**]

2 Press the **OK** button.

3 Press the **+/−** button to select a menu item.

[**On**]
LED turns on.
[**Off**]
LED does not turn on.

4 Press the **OK** button to finish the setting.

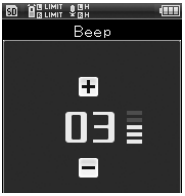
Beep sound [Beep]

This recorder outputs a beep sound to indicate that a button is being operated and to warn you in case of erroneous operation. You can also set up the recorder so that no beep sound is output.

1 [**Menu**] ➔ [**LCD/Sound Menu**] ➔ [**Beep**]

2 Press the **OK** button.

3 Press the **+/−** button to adjust the volume.



- The volume can be adjusted between [**00**] and [**05**].

4 Press the **OK** button to finish the setting.

Language switch (Lang) [Language (Lang)]

You can select the display language for this recorder.

1 [**Menu**] ➔ [**LCD/Sound Menu**] ➔ [**Language(Lang)**]

2 Press the **OK** button.

3 Press the **+/−** button to select a menu item.

- The selectable languages differ depending on the region.

4 Press the **OK** button to finish the setting.

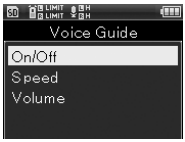
Voice guide [Voice Guide]

This is a function that provides audio guidance of the operating condition. Control this function this function by setting On/Off of the audio guidance and by adjusting the speed and the volume.

1 [**Menu**] ➔ [**LCD/Sound Menu**] ➔ [**Voice Guide**]

2 Press the **OK** button.

3 Press the **+/−** button to select a menu item.



- Select an item to be set from [**On/Off**], [**Speed**], and [**Volume**].

4 Press the **OK** button.

- The selected menu screen appears.

[**On/Off**] setting

This setting sets On/Off of the voice guide.

① By pressing the **+**/**−** button, select either [**On**] or [**Off**] and then press the **OK** button.

[**Speed**] setting

The voice guide speed can be adjusted between [**100%**] and [**400%**].

① Select the speed by pressing the **+**/**−** button and then the **OK** button.

[**Volume**] setting

The voice guide volume can be adjusted between [**01**] and [**05**].

① Select the volume by pressing the **+**/**−** button and then the **OK** button.

Notes

- The start-up sound and the shutdown sound that are output when the power supply source is turned on/off (☞ P. 25) can be eliminated by setting [**Voice Guide**] to [**Off**].
- The volumes of the start-up sound and the shutdown sound can be set by setting [**Volume**] of [**Voice Guide**].
- While a file is being played, the [**Speed**] setting of [**Voice Guide**] is invalid.

Intro play [Intro Play]

When the cursor is placed on a file in a folder, the first few seconds of the file can be played. This function is convenient when you want to find a particular file.

1 [**Menu**] ➔ [**LCD/Sound Menu**] ➔ [**Intro Play**]

2 Press the **OK** button.

3 Press the **+**/**−** button to select a menu item.

[**10sec.**], [**5sec.**], [**3sec.**]
This setting sets the time of the intro play.

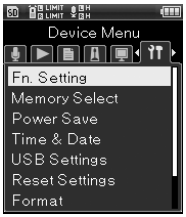
[**Off**]
Intro play does not function.

4 Press the **OK** button to finish the setting.

Fn key setting [Fn. Setting]

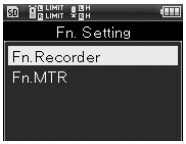
The **Fn** buttons (F1, F2, and F3) of the devicecan be allocated to the desired operations.

1 [**Menu**] ➔ [**Device Menu**] ➔ [**Fn. Setting**]



2 Press the **OK** button.

3 Press the **+/−** button to select a menu item.



[**Fn. Recorder**]
Fn button allocation in the recorder mode.

[**Fn. MTR**]
Fn button allocation in the multi track mode.

4 Press the **OK** button.

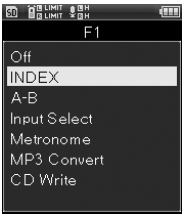
• The selected menu screen appears.

5 Press the **+/−** button to select a **Fn** button for allocation.

6 Press the **OK** button.

• The registration window for the selected **Fn** button.

7 Press the **+/−** button to select a function for registration.



[**Fn. Recorder**] setting

Off	A function cannot be allocated to the **Fn** button.
INDEX	☞ P. 48
A-B	☞ P. 49
Input Select	☞ P. 82
Metronome	☞ P. 100
MP3 Convert	☞ P. 95
CD Write	☞ P. 97

[**Fn. MTR**] setting

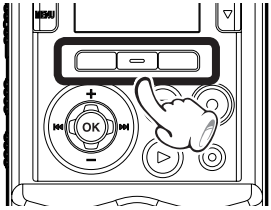
Off	A function cannot be allocated to the **Fn** button.
Input Select	☞ P. 82
Metronome	☞ P. 100
MP3 Convert	☞ P. 95
CD Write	☞ P. 97
Bounce	☞ P. 98
Mute	☞ P. 61
Key change	☞ P. 61
Solo	☞ P. 61

8 Press the **OK** button.

- To set other **Fn** buttons, repeat steps 4 to 7.

The registered function is called.

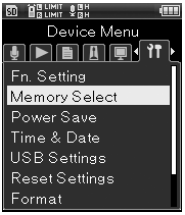
Pressing the **Fn** button displays the setting screen for the registered function.



Memory select [Memory Select]

When an SD card is inserted, recording to the built-in memory or to the SD card can be selected (☞ P. 29).

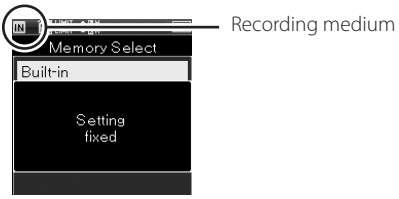
1 [**Menu**] ➔ [**Device Menu**] ➔ [**Memory Select**]



2 Press the **OK** button.

3 Press the **+**/**−** button to select the recording medium.

4 Press the **OK** button to finish the setting.



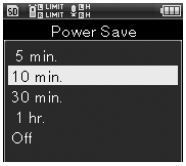
Sleep [Power Save]

When 10 minutes (default setting) has elapsed with the recorder in stop mode following power-on, the power turns off.

1 [**Menu**] ➔ [**Device Menu**] ➔ [**Power Save**]

2 Press the **OK** button.

3 Press the **+/−** button to select a menu item.



[**5 min.**], [**10 min.**], [**30 min.**], and [**1 hr.**]
Set the preferred time.

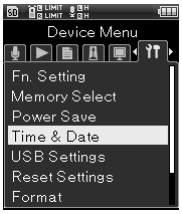
[**Off**]
Sleep mode does not function. If the device is not put into sleep mode, the battery runs out fast.

4 Press the **OK** button to finish the setting.

Time setting [Time & Date]

To reset the date and time, conduct the following steps.

1 [**Menu**] ➔ [**Device Menu**] ➔ [**Time & Date**]



2 Press the **OK** button.

3 Press the ▶▶I/I◀◀ button to select the setting item.

- From "Year," "Month," "Day," "Hour," and "Minute," set the blinking cursor at the item to be set.

4 Press the **+/−** button to select the setting item.

- Following the same steps, press the ▶▶I/I◀◀ button to select a menu item and select the **+/−** button.

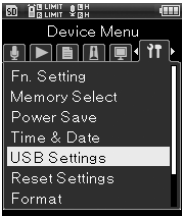
5 Press the **OK** button to finish the setting.

- The device clock starts with the date and time set on the device. Press the **OK** button in sychronization with the time tone or other time indicator.

USB setting [USB Settings]

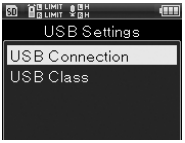
You can select [**PC**], which enables files to be sent/received through a connection to a PC, and [**AC Adapter**], which charges the recorder via connection of a USB connecting AC adapter (A514).

1 [**Menu**] ➔ [**Device Menu**] ➔ [**USB Settings**]



2 Press the **OK** button.

3 Press the **+/−** button to select a menu item.



[**USB Connection**]

This menu item is for setting up connection to the PC.

[**USB Class**]

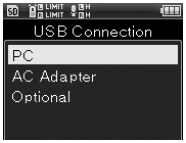
This sets the USB class.

4 Press the **OK** button.

- The selected menu screen appears.

When [**USB Connection**] is selected

① Select a menu item by pressing the **+/−** button and then pressing the **OK** button.



[**PC**]

This menu item sets connection to the PC. The recorder is connected as the storage or the composite.

[**AC Adapter**]

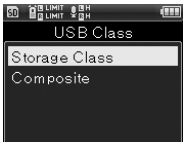
This is the setting used for charging from the PC or for connecting to the AC adaptor (A514).

[**Optional**]

This setting is to check the connecting method every time the USB is connected.

When [**USB Class**] is selected

① Press the **+/−** button to select [**Storage Class**] or [**Composite**] and then press the **OK** button.



[**Storage Class**]

The recorder is recognized as the external storage device by the PC.

[**Composite**]

This is the setting when the recorder is used as an external storage device, USB speaker, or microphone through connection to the PC.

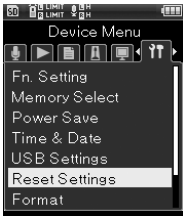
Notes

- When the recorder is connected to a PC for the first time as an external storage device, the driver of this device is automatically installed to the PC.
- When [**USB Connection**] is set to [**AC Adapter**], the PC does not recognize the device.
- When the PC does not recognize the device as an external storage device, switch [**USB Class**] to [**Storage Class**].
- If the battery is low, the USB class setting will switch from Composite to Storage to allow you to recharge.

Setting reset [Reset Settings]

This setting resets each function to the default setting (the setting at the time of shipping from the factory).

1 [**Menu**] ➔ [**Device Menu**] ➔ [**Reset Settings**]



2 Press the **OK** button.

3 Press the **+** button to select [**Start**].

4 Press the **OK** button.

- Each setting returns to the default setting.

Menu setting after setting reset (default setting)

Recording Menu

Menu item	Default setting
[**Rec Mode**] (☞ P. 79)	[**Normal**]
[**Mic Gain**] (☞ P. 80)	[**Built-in Mic**]: [**Mid**]
[**Rec Level**] (☞ P. 81)	[**Manual**]
[**Input Select**] (☞ P. 82)	[**Built-in Mic**]
[**Mic Power**] (☞ P. 83)	Phantom Power: [**48V**] Plug-in Power: [**On**]
[**Rec Format**] (☞ P. 84)	[**PCM**]: [**44.1 kHz/16 bit**]
[**Low Cut Filter**] (☞ P. 85)	[**Off**]
[**Pre-Recording**] (☞ P. 86)	[**Off**]
[**Rec Monitor**] (☞ P. 87)	[**Off**]

Play menu

Menu item	Default setting
[**Play Mode**] (☞ P. 88)	[**One file**]
[**Skip Space**] (☞ P. 88)	Skip: [**File Skip**] Reverse Skip: [**File Skip**]

Device menu [Device Menu]

Metronome Menu

Menu item	Default setting
[**Metronome**] (☞ P. 100)	[**Off**]

LCD/Sound Menu

Menu item	Default setting
[**Backlight**] (☞ P. 102)	Lighting time: [**10sec.**] Dim lighting time: [**30sec.**] Brightness setting: [**2**]
[**LED**] (☞ P. 103)	[**On**]
[**Beep**] (☞ P. 103)	[**03**]
[**Language**] (☞ P. 104)	[**English**]
[**Voice Guide**] (☞ P. 104)	On/Off: [**On**] Speed: [**100%**] Volume: [**03**]
[**Intro Play**] (☞ P. 105)	[**Off**]

Device menu

Menu item	Default setting
[**Fn. Setting**] (☞ P. 106)	Fn Setting Recorder: **F1** [**INDEX**] **F2** [**Input Select**] **F3** [**Metronome**] Fn Setting MTR: **F1** [**Mute**] **F2** [**Bounce**] **F3** [**Off**]
[**Memory Select**] (☞ P. 107)	[**Internal memory**]
[**Power Save**] (☞ P. 108)	[**10min.**]
[**USB Settings**] (☞ P. 109)	USB Connection: [**PC**] USB class: [**Storage Class**]

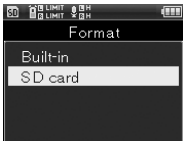
Format [Format]

When the recorder is formatted, all stored files are deleted. Before conducting formatting, be sure to transfer important files to your PC.

1 [**Menu**] ➔ [**Device Menu**] ➔ [**Format**]

2 Press the **OK** button.

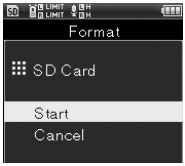
3 Press the **+**/**−** button to select the recording medium to format.



4 Press the **OK** button.

- The screen shifts to the [**Format**] screen.

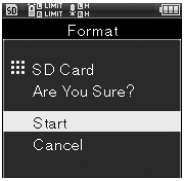
5 Press the **+** button to select [**Start**].



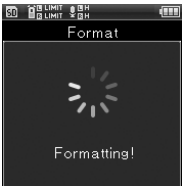
6 Press the **OK** button.

- [**All data will be erased**] is displayed for two seconds, and [**Start**], [**Cancel**] light up.

7 Press the **+** button to select [**Start**] again.



8 Press the **OK** button.



- [**Formatting**] is displayed, and formatting starts. When [**Format done**] blinks, formatting is completed.

Notes

- Never format the recorder from the PC.
- Upon formatting, all existing data including files for which File Lock was set and read-only files are lost.
- A file recorded after formatting may be named [**0001**].
- To format the setting of each function, conduct [**Reset Settings**] (☞ P. 111).
- When inserting an SD card into the recorder, always check whether the recording medium to be operated is [**Internal memory**] or [**SD card**] (☞ P. 107).
- Check the remaining battery level beforehand in order to avoid running out of the battery during the process. In addition, several tens of seconds may pass before the process completes. Avoid conducting the following operations during processing. The data may be destroyed.
  ① Removing the AC adaptor during processing.
  ② Removing the battery during processing.
  ③ When the recording medium is [**SD card**], removing the SD card during processing.
- When the SD card is formatted using the recorder, the SD card will be the quick format. [**Format**] does not completely delete the data in the SD card. It only updates the file management information. When transferring or discarding the recorder, be careful that data is not leaked from the SD card. It is recommended to destroy the SD card before discarding the recorder.

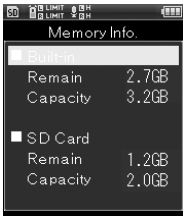
Memory information [Memory Info.]

On the menu screen, remaining space and the capacity of the recording medium can be displayed.

1 [**Menu**] ➔ [**Device Menu**] ➔ [**Memory Info.**]

2 Press the **OK** button.

3 [**Remain**] and [**Capacity**] of the recording medium can be displayed.



- When no SD card is inserted, only information on the built-in memory is displayed.

4 After checking the information, press the **OK** button.

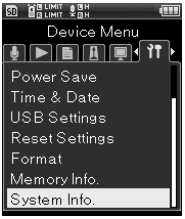
Note

- The capacity of the recording medium displayed on the recorder includes the capacity of the management file used by the recorder. The capacity displayed in the SD card is lower than the specified capacity. However, it is not an error.

System information [System Info.]

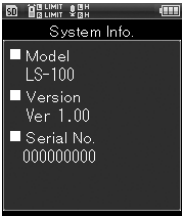
On the menu screen, the device information can be checked.

1 [**Menu**] ➔ [**Device Menu**] ➔ [**System Info.**]



2 Press the **OK** button.

3 [**Model**] [**Version**] [**Serial No.**] are displayed.



4 After checking the information, press the **OK** button.

Chapter 7

About the PC

Using the recorder on your PC

When connected to a PC, the recorder enables you to do the following:

Apart from using this recorder as a multi-track recorder or a music player, you can also use it as an external memory for your PC, that is, as a storage device (☞ P. 121).

The PC operating environment

Windows

Operating system:

Microsoft Windows XP/Vista/7

Standard installation

Compatible PC's:

Windows PC's equipped with one or more free USB ports

Macintosh

Operating system:

Mac OS X 10.4.11 to 10.7

Standard installation

Compatible PC's:

Apple Macintosh series equipped with one or more free USB ports

Notes

- This is the operational environment for saving files recorded by this recorder to your PC via the USB connection.
- The support service does not cover the recorder if your PC has been updated from Windows 95/98/Me/2000 to Windows XP/Vista/7.
- Even if the operational environment is satisfied, we do not support self-modified PC's.

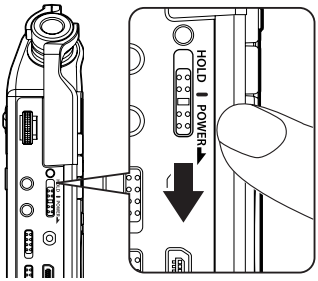
Precautions on using the recorder connected to a PC

- When you are downloading a file from the recorder or uploading a file to the recorder, do not remove the USB cable even if the screen is indicating you can. Data is still being transferred while the PEAK indicator light (R) is blinking. When removing the USB cable, be sure to follow the description on ☞ P.119. If the USB cable is removed before the drive is stopped, data may not be successfully transferred.
- On a PC, do not format the drive of the recorder. Initialization is not successfully achieved on a PC. For initialization, follow the instructions in the [**Format**] screen of the recorder (☞ P.113).
- If folders or files stored on the recorder are moved or renamed by using a file management tool in Windows or Macintosh, the order of files may be changed or files may become unrecognizable.
- Data can be read from or written to the recorder even though the attribute of the recorder drive is set to read-only by the operating system of the PC.
- As noise may cause adverse effects to electronic devices near the recorder, unplug the external microphone and headphone when you connect the recorder to a PC.

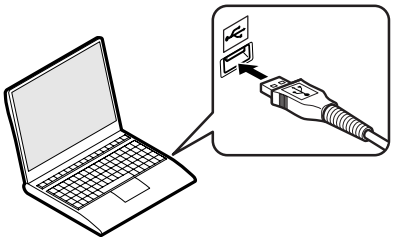
Connecting to your PC

Windows **Macintosh**

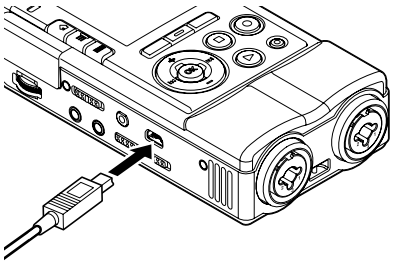
1 Turn the recorder on.



2 Connect the USB cable to the USB port of the PC.



3 Be sure to connect the USB cable to the connecting terminal of the recorder while the recorder is in stop mode or turned off.



- [**Remote(Storage)**] appears on the recorder while the USB cable is being connected.
- When you set up the USB connection on the recorder, the recorder will not be connected to the PC while [**AC Adapter**] is selected. Select [**PC**] in the USB connection setting (☞ P. 109).
- When you connect the recorder to Windows and open [**My Computer**], it will be recognized by the drive name of the product name. While an SD card is inserted, [**Removable Disk**] appears.
- When you connect the recorder to Mac OS, it will be recognized by the drive name of the product name on the desktop. While an SD card is being inserted, [**Untitled**] appears.

Notes

- Be sure to exit the HOLD mode on the recorder before connecting the USB cable.
- For more information on the USB port on your PC, refer to the user's manual for your PC.
- Be sure to push the USB connector all the way in. Otherwise, the recorder may not operate properly.
- When you connect the recorder through a USB hub, operation may become unstable. In such cases, refrain from using a USB hub.
- Be sure to use the designated USB cable supplied with the recorder. If any other company's cable is used, it may lead to malfunction of the recorder. Also, never use the dedicated USB cable with any other company's products.

Disconnecting from your PC

Windows

1 Click [ ] on the task bar located at the lower-right corner of the screen. Click [**Safely remove USB Mass Storage Device**].

- The drive letter will differ depending on the PC being used.

2 Be sure that the recorder PEAK indicator light (R) is off before disconnecting the USB cable.

- The PEAK indicator light (R) will light up orange while the recorder is charging. The USB cable may be removed during the charging operation.

Macintosh

1 Drag and drop the drive icon for this recorder displayed on the desktop to the Recycle Bin icon.

2 Make sure that the recorder PEAK indicator light (R) is off before disconnecting the USB cable.

- The PEAK indicator light (R) will light up orange while the recorder is charging. The USB cable may be removed during the charging operation.

Notes

- NEVER disconnect the USB while the PEAK indicator light (R) is flashing. If you do, the data may be destroyed.
- When the recorder is connected to a PC, the power will be supplied from the USB cable supplied with the recorder. No power supply is required from the batteries or the AC adapter to this recorder.
- For more information on the USB port on your PC, refer to the user's manual for your PC.
- Be sure to connect the USB cable directly to the USB port on your PC.
- Be sure to push the USB connector all the way in. Otherwise, the recorder may not operate properly.

Transferring voice files to your PC

There are five recording folders available in the recorder mode, which appear on the PC as [**FOLDER_A**] through [**FOLDER_E**]. Files you record will be saved in these folders. In addition, the folder for the multi-track mode appears as [**PRJ000**].

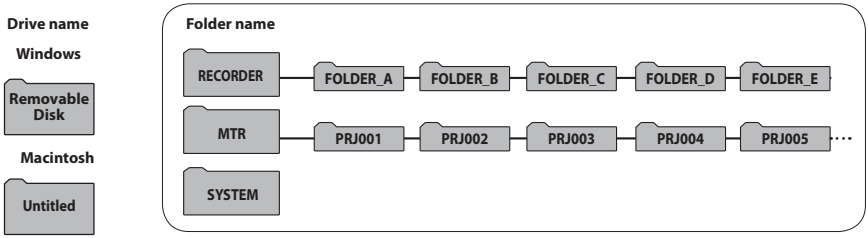
Windows

1. Connect the recorder to your PC (☞ P. 118).
2. Open the Explorer window.
   - When you open [**My Computer**], the recorder will be recognized by the drive name. While an SD card is inserted, it appears as [**Removable Disk**].
3. Click on the "product name" folder.
4. Copy the data.
5. Disconnect the recorder from your PC (☞ P. 119).

Macintosh

1. Connect the recorder to your PC (☞ P. 118).
   - When you connect the recorder to Mac OS, it will be recognized by the drive name of the product name on the desktop. When an SD card is inserted, it will be recognized by the drive name [**Untitled**].
2. Double-click on the "product name" removable icon on the desktop.
3. Copy the data.
4. Disconnect the recorder from your PC (☞ P. 119).

Drive name and folder name when a PC is connected (SD card)



Notes

- During data communications, [**Busy**] appears and the PEAK indicator light (R) flashes. NEVER disconnect the USB while the PEAK indicator light (R) is flashing. If you do, the data may be destroyed.
- In the Windows operating environment, 24 bit WAV format files cannot be played back.
- If the sound board of your PC does not support the 24 bit WAV format, the recorder cannot play back 24 bit supporting software correctly.

Using the recorder as a USB microphone/speaker

This recorder can be used as a USB microphone or a USB speaker.

Note

- While the recorder is used as a USB microphone, it is available as a USB stereo microphone regardless of the recording mode. If connecting an external microphone to this recorder, use a stereo microphone.

Using the recorder as an external memory for your PC

This recorder enables you to transfer data stored in it to your PC, or to save data stored in your PC to this recorder.

Windows

1. Connect the recorder to your PC (☞ P. 118).
2. Open the Explorer window
   - When you open [**My Computer**], the recorder will be recognized by the drive name. While an SD card is inserted, it appears as [**Removable Disk**].
3. Click on the "product name" folder.
4. Copy the data.
5. Disconnect the recorder from your PC (☞ P. 119).

Macintosh

1. Connect the recorder to your PC (☞ P. 118).
   - When you connect the recorder to Mac OS, it will be recognized by the drive name of the product name on the desktop. When an SD card is inserted, it will be recognized by the drive name [**Untitled**].
2. Double-click on the "product name" removable icon on the desktop.
3. Copy the data.
4. Disconnect the recorder from your PC (☞ P. 119).

Note

- During data communications, [**Busy**] appears and the PEAK indicator light (R) flashes. NEVER disconnect the USB while the PEAK indicator light (R) is flashing. If you do, the data may be destroyed.

Chapter 8

For Quick Reference

Alarm message list

Message	Description	Action
[Battery low]	Battery power is getting low.	Charge the batteries. If you run out of battery power soon after charging, the battery has reached its life. Replace it with a new one. (☞ P. 22).
[File locked]	Attempted to delete a locked file.	Unlock the file (☞ P. 90).
[Select a recorder and record.]	Attempting to record other than in the recorder mode.	Select a folder from among [**Folder A**] to [**Folder E**] and try recording again (☞ P. 34).
[No more can be set]	The file is full of index marks (maximum of 99 marks).	Erase index marks that are no longer required (☞ P. 48).
[Folder full]	The folder is full of files (maximum of 999 files).	Erase unnecessary files (☞ P. 50).
[Memory error]	Error in the internal memory.	Please contact the Olympus Customer Support Center (☞ P. 138).
[Card error]	The SD card is not recognized correctly.	Remove the SD card, and insert it again (☞ P. 29 to 30).
[Illegally copied file]	———	Erase the files (☞ P. 50).
[Memory full]	No remaining memory.	Erase unnecessary files (☞ P. 50).
[No file]	No files are found in the folder.	Select another folder (☞ P. 34).
[Format error]	There was an error while formatting the recorder's memory.	Reformat the memory (☞ P. 113).
[Can't create the system file. Connect to PC and erase unnecessary file]	The file for management cannot be created due to a shortage of capacity for remaining memory.	Connect the recorder to a computer and delete any unnecessary files.
[Cannot play this file]	Incompatible format.	Please confirm that the file can be played on this recorder (☞ P. 46).
[Select a file]	No file is selected.	Please select a file then carry out the operation (☞ P. 34, 45).
[Same folder. Can't be moved (copied).]	Attempting to move (copy) into the same folder.	Please select another folder.

Alarm message list

Message	Description	Action
[Same files can't be moved (copied)]	A file with the same filename already exists in the destination folder.	Please select another file.
[This file can't be divided]	Attempting to split a file other than a PCM or MP3 file recorded in this recorder.	Please select another file.

Troubleshooting

Symptom	Probable cause	Action
Nothing appears on the display	The battery is not loaded properly	Verify that the battery's polarities + and - are correct (☞ P. 22).
	Battery power is getting low.	Charge the battery or replace with a new battery (☞ P. 22).
	The power is off.	Turn the power on (☞ P. 25).
Won't start	Battery power is getting low.	Charge the battery or replace with a new battery (☞ P. 22).
	The power is off.	Turn the power on (☞ P. 25).
	The recorder is in HOLD mode.	Release the recorder from HOLD (☞ P. 26).
Unable to record	No remaining memory.	Erase unnecessary files (☞ P. 50).
	The maximum number of files has been reached.	Change to any other folder (☞ P. 34).
No playback sound heard	The headphone is connected.	Unplug the headphone to use the internal speaker.
	The volume level is set to [**0**].	Adjust the volume level (☞ P. 46).
Recording level too low	The recording level has not been adjusted.	Adjust the recording level and then try recording once more (☞ P. 81).
	The microphone sensitivity is too low.	Set [Mic Sense] to [**HI**] or [**MID**] and then try recording once more (☞ P. 80).
	This could potentially be because the output level for the connected external devices is too low.	If adjusting the recording level does not help you get a clear recording, adjust the output level for the connected devices.
Files are not recorded in stereo	The connected external microphone is monaural.	When recording while an external monaural microphone is connected, the sound will only be recorded by the L-channel.
Noise is audible through the recording monitor	Acoustic feedback is occurring.	When the built-in speaker amps and the like are connected there is a risk that audio feedback will occur while recording. It is recommended that you use a headphone for the recording monitor.
		Perform adjustments, such as further distancing the headphone from the microphone, and not pointing the headphone at the microphone.
Unable to set index marks	The maximum number of marks (99) has been reached.	Erase unnecessary marks (☞ P. 48).
	The file is locked.	Unlock the file (☞ P. 90).
	The file is read-only.	Unlock the file or cancel the read-only setting of the file on the PC.

Troubleshooting

Symptom	Probable cause	Action
Cannot recharge	Contains battery other than the specified battery.	Use the supplied rechargeable batteries.
	The battery is not properly inserted.	Insert the battery properly.
	USB class set to [**Composite**].	Change the USB class setting to [**Storage**] (☞ P. 109).
		Connect the recorder via USB while pressing and holding the **STOP** button to recharge it (☞ P. 24).
Cannot find files	Wrong folder.	Switch to the correct folder (☞ P. 34).
Noise heard during playback	The recorder was wiped or shaken during recording.	———
	The recorder was placed near a cell phone or fluorescent lamp while recording or during playback.	Move the recorder.
Unable to erase a file	The file is locked.	Unlock the file (☞ P. 90).
	The file is read-only.	Unlock the file or cancel the read-only setting of the file on the PC.
Unable to erase a folder	There is a file that cannot be recognized by the recorder in the folder.	Connect the recorder to your PC and erase the folder.
No sound is produced from a certain track in the multi-track mode	The track is muted.	Cancel the mute condition (☞ P. 61).
	The output volume of the track is reduced.	Increase the output volume of the track (☞ P. 62).
No sound from the connected musical instrument	[**Input Select**] is incorrectly set.	Make sure the [**Input Select**] is correctly set (☞ P. 82).
	The recording level is low.	Use the **REC LEVEL** dial to adjust the recording level (☞ P. 37).
	The [**Rec Monitor**] is set to [**Off**].	Set the [**Rec Monitor**] to [**On**] (☞ P. 87).
CD writing is not available	The selected file is not enabled for CD writing.	Select a PCM format [**44.1kHz/16bit**] file that is enabled for CD writing.
Cannot be converted to an MP3 file	The selected file is not enabled to be converted to an MP3 file.	Select a PCM format [**44.1kHz/16bit**] file that is enabled to be converted to an MP3 file.
Cannot perform bouncing	The volume of the track is either completely reduced or muted.	Check the volume of the track and the [On/Off] of the mute (☞ P. 61).
	The SD card does not have enough free space.	Erase unnecessary files (☞ P. 50).
Cannot use the tuner	[**Input Select**] is incorrectly set.	Check the connected musical instrument to set the [**Input Select**] correctly (☞ P. 82).

Accessories (optional)

Accessories exclusive to the Olympus voice recorder can be purchased directly from Online Shop on our company's website.

Stereo microphone: ME51SW

The built-in large-diameter microphone enables sensitive stereo recording.

2-channel microphone (omni-directional): ME30W

Two ME30 monaural microphones come in a set with a miniature tripod and a connection adapter. These are highly sensitive omni-directional microphones supported by plug-in power which are well-suited to recording musical performances.

Compact Gun Microphone (unidirectional): ME31

This directional microphone is useful for recordings such as outdoor recording of wild birds singing. The metal body provides a sturdiness to the high rigidity.

Monaural microphone (unidirectional): ME52W

Use this monaural microphone that helps reduce the effect of ambient noise and record sounds from a remote location.

Monaural tie clip microphone (omni-directional): ME15

Small concealing microphone with a tie-clip.

Telephone pickup: TP8

This earphone type microphone can be plugged into your ear while phoning. The voice or conversation over the phone can be clearly recorded.

Connecting cord: KA333

This connecting cord has stereo mini-plugs (ø3.5) with resistance at both ends. Used during recording to connect the earphone jack output of the recorder to the external microphone input jack. Converting plug adapters (PA331/PA231) that convert to the monaural mini plug (ø3.5) or monaural mini plug (ø2.5) are also enclosed.

Connecting cord: KA334

This connecting cord has stereo mini-plugs (**ø**3.5) with resistance at both ends. Set [**Input Select**] to [**Line**] on the recorder.

Exclusive remote control set: RS30W

When the receiver is plugged into the REMOTE jack, the recorder's recording and stop functions can be operated through the remote control. The receiving position can be adjusted, thereby allowing you to operate the recorder from various different angles.

Glossary

Glossary	Description
Sampling frequency (sampling rate) [**Hz/kHz**]	The rate or frequency at which an analogue signal is analyzed to determine acoustic delicacies. The higher sampling frequency produces less difference in forward/backward sounds.
Quantization bits [bit depth][**bit**]	The number of quantization bits helps determine how much data is required to save a record when digitizing analog signals (such as voice).
Bit rate [**kbps**]	A Bit Rate indicates how many data bits are transmitted per second.A 128 kbps file, for example, uses 128 kbits per second to encode data. The smaller the bit rate you select, the worse the quality, and the smaller the size it will output. The sound quality varies depending on digital audio compression algorithms (such as MP3), even if the bit rates are the same.Even if the bit rates are the same, sound quality varies depending on the digital audio compression algorithm (such as MP3).
Linear PCM format	A linear PCM format is used so that no data gets lost due to compression and original sound stays intact.This format is used for music CDs (CD-DA).
MP3 format	This is one of the most popular digital audio compression algorithms. It achieves a compression factor of about twelve while preserving sound quality.
Memory (media)	This is a storage system that does not lose the data stored on it even when the power is removed. In this manual, it refers to the built-in flash memory and the SD card.
Encoding	Encoding is a process in which the information obtained from a source is converted into data according to certain rules. Or it is a process in which data is converted from one format to another (such as audio compression) according to certain rules.

Specifications

General points

Recorder	Simultaneous recording track	Recorder mode: 2 Multi-track mode: 2
	Simultaneous playback track	Recorder mode: 2 Multi-track mode: 8
	Maximum recording file size	PCM format: 2GB MP3 format: 4GB
Recording format	Linear PCM (Pulse Code Modulation) format	[96.0kHz/24bit], [96.0kHz/16bit], [88.2kHz/24bit], [88.2kHz/16bit], [48.0kHz/24bit], [48.0kHz/16bit], [44.1kHz/24bit], [44.1kHz/16bit] [44.1kHz (mono)]
	MP3 (MPEG-1 Audio Layer3) format	[320kbps], [256kbps], [128kbps], [64kbps (mono)]
Recording medium	Built-in memory	4GB
	SD card	SD card (512MB to 2GB) SDHC card (4GB to 32GB) SDXC card (64GB)
Metronome	Metronome sound source	2
	Irregular meter	1/1, 1/4 to 8/4, 6/8
	Tempo	40.0 to 208.0BPM
Tuner	Tuner type	Chromatic, Guitar, and Bass
	Calibration range	435Hz to 445Hz (1Hz steps)
Data type	WAV format	
	[Recording] [Playback]	Quantization bits 16/24bit
		Sampling frequency 44.1/48.0/88.2/96.0kHz
	MP3 format	
	[Recording] [Playback]	Bit rate 320/256/128/64kbps
		Sampling frequency 44.1kHz
Signal processing	[AD/DA conversion] 16/24bit, 44.1/48.0/88.2/96.0kHz	
Monitor	2.0 inch color LCD monitor	

Specifications

Input	Built-in microphone	Directional microphone
	MIC/LINE input	Mini stereo phone jack MIC: input impedance 10kΩ LINE: input impedance 12.5kΩ
	XLR/standard phone input	XLR (balanced input)/ Standard phone (unbalanced input) combo jack XLR: input impedance 10kΩ Phone: input impedance 10kΩ
Output	EARjack	ø 3.5 mm impedance more than 8Ω 4 mW + 4 mW (at 16Ω load) **Maximum headphone output:** ≤ 150 mV (according to EN 50332-2) **Wide band characteristic headphone output:** 75 mV ≤ (according to EN 50332-2)
	Built-in speaker	Built-in ø 28 mm round dynamic speaker 430mW (8Ω)
Phantom power	48V, 24V L/R channels: less than 20mA in total	
USB	USB2.0High Speed Mass storage operation, audio interface operation	
Input power	Olympus lithium ion battery (LI-50B) External power supply: AC adapter (A514) (DC 5V)	
External dimensions	159.0mm × 70.0mm × 33.5mm (without protrusions)	
Weight	280g (Lithium-ion battery included.)	

Reference input level

Input source	Microphone sensitivity	Level value
Built-in microphone	HI	74dBSPL
	MID	94dBSPL
	LOW	114dBSPL
MIC	HI	-58dBV
	MID	-47dBV
	LOW	-27dBV
LINE	—	-6dBV

XLR (balanced input)	HI	-58dBu
	LOW	-38dBu
Standard phone (unbalanced input)	—	-32dBu

General frequency response

■ **During recording/during playback (When recording via the MIC/LINE/PHONE/ XLR input):**

Linear PCM format

Recording mode	Frequency response
96.0 kHz/24bit	20 Hz to 44 kHz
96.0 kHz/16bit	20 Hz to 44 kHz
88.2 kHz/24bit	20 Hz to 40 kHz
88.2 kHz/16bit	20 Hz to 40 kHz
48.0 kHz/24bit	20 Hz to 23 kHz
48.0 kHz/16bit	20 Hz to 23 kHz
44.1 kHz/24bit	20 Hz to 21 kHz
44.1 kHz/16bit	20 Hz to 21 kHz
44.1 kHz/mono	20 Hz to 21 kHz

MP3 format

Recording mode	Frequency response
320 kbps	50 Hz to 20 kHz
256 kbps	50 Hz to 20 kHz
128 kbps	50 Hz to 17 kHz
64 kbps (mono)	50 Hz to 8 kHz

■ **Built-in stereo microphone (During recording mode):**

20 Hz to 20 kHz

- However, when recording in the MP3 format, the upper limit value of the frequency response depends on each recording mode (See the table above).

Guide to recording times

■ **Linear PCM format**

Recording mode	Built-in memory (4 GB)	SD card			
		8 GB	16 GB	32 GB	64 GB
96.0kHz/24bit	Approx. 1h. 35min.	Approx. 3h. 40min.	Approx. 7h. 15min.	Approx. 14h. 55min.	Approx. 30h. 00min.
96.0kHz/16bit	Approx. 2h. 15min.	Approx. 5h. 30min.	Approx. 10h. 30min.	Approx. 22h. 00min.	Approx. 45h. 00min.
88.2kHz/24bit	Approx. 1h. 40min.	Approx. 4h. 00min.	Approx. 7h. 50min.	Approx. 16h. 10min.	Approx. 32h. 40min.
88.2kHz/16bit	Approx. 2h. 30min.	Approx. 6h. 00min.	Approx. 11h. 30min.	Approx. 24h. 00min.	Approx. 49h. 00min.
48.0kHz/24bit	Approx. 3h. 00min.	Approx. 7h. 15min.	Approx. 14h. 30min.	Approx. 29h. 30min.	Approx. 60h. 00min.
48.0kHz/16bit	Approx. 4h. 45min.	Approx. 11h. 00min.	Approx. 21h. 30min.	Approx. 44h. 30min.	Approx. 90h. 00min.
44.1kHz/24bit	Approx. 3h. 15min.	Approx. 8h. 00min.	Approx. 15h. 30min.	Approx. 32h. 00min.	Approx. 65h. 00min.
44.1kHz/16bit	Approx. 5h. 00min.	Approx. 12h. 00min.	Approx. 23h. 30min.	Approx. 48h. 30min.	Approx. 98h. 00min.
44.1kHz/mono	Approx. 10h. 00min.	Approx. 24h. 00min.	Approx. 47h. 00min.	Approx. 97h. 00min.	Approx. 196h. 00min.

■ **MP3 format**

Recording mode	Built-in memory (4 GB)	SD card			
		8 GB	16 GB	32 GB	64 GB
320 kbps	Approx. 22h. 30min.	Approx. 53h. 00min.	Approx. 104h. 00min.	Approx. 214h. 00min.	Approx. 432h. 00min.
256 kbps	Approx. 28h. 30min.	Approx. 66h. 30min.	Approx. 130h. 00min.	Approx. 268h. 00min.	Approx. 540h. 00min.
128 kbps	Approx. 57h. 00min.	Approx. 133h. 00min.	Approx. 261h. 00min.	Approx. 537h. 00min.	Approx. 1081h. 00min.
64 kbps (mono)	Approx. 114h. 00min.	Approx. 267h. 00min.	Approx. 522h. 00min.	Approx. 1074h. 00min.	Approx. 2163h. 00min.

Notes

- The values above are for reference only.
- Available recording time may be shorter if many short recordings are made (The displayed available recording time and recorded time are approximate indications).
- Variations in the available recording time will arise as there may be differences in the available memory depending on your SD card.
- Note that the differences in the available recording time may become more apparent if the number of bits/bit rate is lower.

Maximum recording time for a single file

- The maximum capacity for a single file is limited to approx. 2GB for the linear PCM format.
- The maximum capacity for a single file is limited to approx. 4GB for the MP3 format.

Guide to battery life

■ **lithium ion battery:** (linear PCM format)

Recording mode	Built-in stereo microphone (During recording mode)	When recording with phantom power	Headphone playback
96.0 kHz/24bit	Approx. 9h. 30min.	Approx. 2h. 15min.	Approx. 12h. 30min.
96.0 kHz/16bit	Approx. 11h. 00min.	Approx. 2h. 30min.	Approx. 12h. 30min.
88.2 kHz/24bit	Approx. 10h. 00min.	Approx. 2h. 30min.	Approx. 13h. 30min.
88.2 kHz/16bit	Approx. 11h. 15min.	Approx. 2h. 30min.	Approx. 14h. 00min.
48.0 kHz/24bit	Approx. 11h. 00min.	Approx. 2h. 30min.	Approx. 14h. 00min.
48.0 kHz/16bit	Approx. 12h. 15min.	Approx. 2h. 30min.	Approx. 14h. 15min.
44.1 kHz/24bit	Approx. 11h. 30min.	Approx. 2h. 45min.	Approx. 15h. 45min.
44.1 kHz/16bit	Approx. 12h. 30min.	Approx. 2h. 45min.	Approx. 16h. 15min.
44.1 kHz (mono)	Approx. 12h. 30min.	Approx. 2h. 45min.	Approx. 17h. 30min.

■ **Lithium ion battery:** (MP3 format)

Recording mode	Built-in stereo microphone (During recording mode)	When recording with phantom power	Headphone playback
320 kbps	Approx. 11h. 15min.	Approx. 2h. 30min.	Approx. 15h. 00min.
256 kbps	Approx. 11h. 30min.	Approx. 2h. 30min.	Approx. 15h. 30min.
128 kbps	Approx. 11h. 45min.	Approx. 2h. 30min.	Approx. 16h. 15min.
64 kbps (mono)	Approx. 12h. 30min.	Approx. 2h. 45min.	Approx. 16h. 15min.

Notes

- The values above are for reference only.
- Battery life is measured by Olympus. It varies greatly according to the conditions of use.

Technical assistance and support

The following are contact information for technical support for Olympus recorders and software only.

- **Technical Hotline Number in the U.S. and Canada**
  1-888-553-4448
- **User Support E-mail address in the U.S. and Canada**
  distec@olympus.com
- **Technical Hotline Number in Europe**
  Toll free number: 00800 67 10 83 00
  available for Austria, Belgium, Denmark, Finland, France, Germany, Italy, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom
  Charged numbers for the Rest of Europe
  + 49 180 567 1083
  + 49 40 23773 4899
- **User Support E-mail address in Europe**
  dss.support@olympus-europa.com

For customers in Europe

"CE" mark indicates that this product complies with the European requirements for safety, health,environment and customer protection.

This symbol [crossed-out wheeled bin WEEE Annex IV] indicates separate collection of waste electrical and electronic equipment in the EU countries. Please do not throw the equipment into the domestic refuse. Please use the return and collection systems available in your country for the disposal of this product.
Applicable Product : LS-100, AC adapter

This symbol [crossed-out wheeled bin Directive 2006/66/EC Annex II] indicates separate collection of waste batteries in the EU countries. Please do not throw the batteries into the domestic refuse. Please use the return and collection systems available in your country for the disposal of the waste batteries.

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